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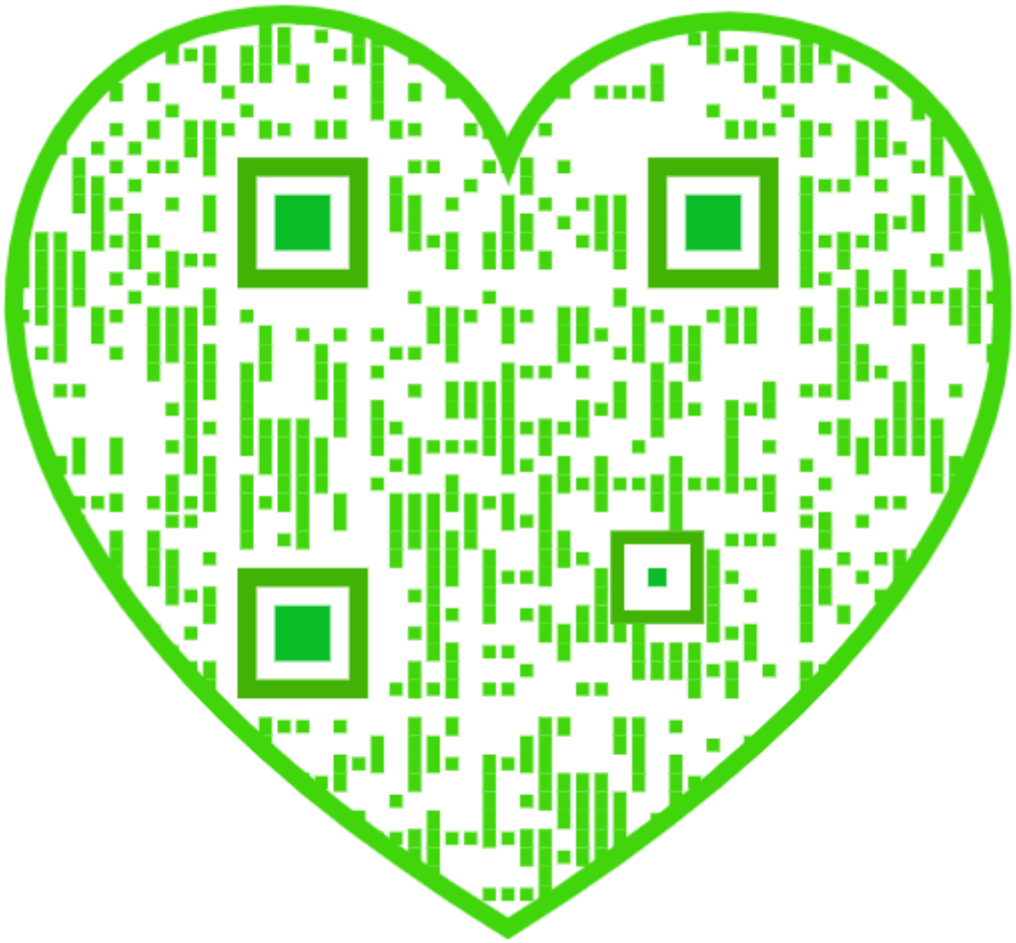
The Lumbermans'

HAND-BOOK

OF

Inspection and Grading.



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THE LUMBERMAN'S

HAND BOOK

FOR

THE INSPECTION AND MEASUREMENT

OF LUMBER AND LOGS.

Wm. B. Judson, Comp

A Compendium of Useful Knowledge for Lumber Manufacturers and Dealers, comprising The Northwestern Lumberman Log Rule (a New Standard for Reducing Logs to Inch Board Measure), with Synopsis and Comparison with Doyle's and Scribner's Rules; a full description of Chicago Yard Grading, Chicago Cargo Inspection, Chicago Hardwood Inspection, Michigan Inspection Law, Albany Inspection, Boston Inspection, St. Louis Hardwood and Southern Timber Inspection, Minneapolis Inspection, Maine Survey, New Orleans Inspection, Etc., Etc.

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CHICAGO:
W. B. JUDSON, PUBLISHER,
Editor NORTHWESTERN LUMBERMAN.
1879.

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THE

NORTHWESTERN LUMBERMAN

IS the Representative Organ of the Lumber Trade. Invaluable alike to manufacturers, wholesale dealers, retailers and consumers of lumber. It gives quotations from all the leading lumber markets, corrected weekly. A weekly compendium of all the lumber news of the country.

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THE LUMBERMAN PUBLISHING CO.,
Lake and LaSalle Streets, CHICAGO.

8-34425

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INTRODUCTORY.

One of the most difficult tasks in the domain of lumber literature is the putting upon paper of a description of those various divisions or grades which are found to prevail in different localities. Surveying, as it is known in Maine and some other localities, Inspection, as it is termed in Albany and the West, consists of fixing a value to each individual piece of lumber. Inasmuch as no two are exactly alike, it is impossible to establish an arbitrary rule for the guidance of the Inspector, and, as a consequence, the individual judgment must determine the value of each, from a consideration of its general character, and the uses to which it can be put in house building or manufacture.

As the judgment of men varies as much as each piece of lumber from its fellow, it becomes very difficult for one to see the value and character of a board exactly as it is seen by all others, and hence it is well nigh impossible to prescribe what shall constitute a board of any particular grade. If it be perfect in all

other respects, it may not be of equal value with another equally, but no more perfect board, in that it is of a more glassy, brash and tough texture, less straight and free in grain, and wholly unfit for the finer uses to which its fellow may be well suited. All these and many other considerations enter into the proper and judicious assorting and valuing of lumber, and must be determined according to the judgment and experience of the Inspector.

But while no arbitrary rule can be established, it was determined early in the history of the trade, that one could be applied to the general characteristics of lumber, which would guide both the buyer and seller in determining the value of a given piece. While these general characteristics applied to the distributions between the manufacturer and the consumer in the infancy of the trade, while but a comparatively small quantity was produced and consumption kept pace with production, when the demand increased and it was found necessary to build mills in the forest at a distance from the consumer, middle-men became necessary, and at various points in the country immense depots were established, to which the mill product could be shipped, and whence it could be distributed. But the still increasing population moving farther and

farther from the points of supply, necessitated another set of distributors, and the first began to confine their trade to selling, at wholesale, to the latter as retailers.

Now, the rules which had guided the mill-man in selling to his customers, required modification, and to prevent too great an advance in price, the retailer was compelled to obtain his compensation through a division into grades, and this system of grading has advanced to its present status, which may be almost classed among the fine arts, yet marked by as great a variance as there are individual judgments to determine it. As an instance, the description of Chicago yard-grading, in this work, was submitted to the criticism of ten of the leading graders of the city, and the criticisms which marked the disagreement of one with another, as to what classification a given piece of lumber was entitled to, were certainly amusing.

It is the purpose of this work to endeavor to point out the general laws governing the inspection of lumber, without expecting to wholly harmonize the ever conflicting opinions of the grand army of knights of the board-rule. If, however, it succeeds in establishing a more generally uniform system of Inspection and yard grading, the effort may well be called successful.

Albany, N. Y., after Bangor, Me. and Port Deposit,

Pa., early became the most important center of the lumber trade of the country, and promulgated a system of Inspection, or sorting into qualities, which soon superceded the early rule of Surveying, which was simply straight measure, or the determining of the number of feet, regardless of quality. In this connection it may properly be said, that in the early days of lumber manufacturing, it was the aim and custom of the producer to cut only the better class of trees, and it is within the memory of the writer, when the grade now known as Selects, Fine Common, or Picks, was the poorest which found its way to market as Common, and that which now comprises the bulk of the lumber handled, was considered as only fit to be sold at the mill, and such of it as by accident found its way to market was sold for what it would bring, often not realizing the cost of transportation. The growth of the trade, however, soon admonished the manufacturer that he must be more conservative with his timber, and the shipments and sale of Coarse Common, which included all between the present grade of Selects and Culls, was undertaken.

The fast depleting forests and the increased consumption throughout the country, especially of the lower grades, soon demonstrated that consumers were

utilizing the cheaper product for Cutting-up Lumber, and that doors, sash and other building material could be made equally well from this grade as from the higher priced qualities. Albany now began to select out the nicer Common below the Fine Common grade, and Pickings became a favorite in that district.

If the wholesaler could make Pickings out of the Common, the retailer, equally fertile in resource, could make other qualities, and so sub-divisions, such as A and B Selects, B Box, B Stock, 8-inch Flooring, and a hundred other designations came into vogue. These are one and all but sub-divisions of the old and well known Albany grades, Clear, Fourths, Box, Common, and Culls, more particularly of the Common. The designations given are uniform, but as before remarked, the selection varies widely, and an A Select in one yard may be bought as a Third Clear, or A Box, or even as a B Box in another.

The various systems of Inspection, Grading and Measurement are given in the following pages in about the order of their adoption in the different localities. It is more than probable that if any one standard of yard grading is adopted universally at wholesale centers, it will be something very similar to that in vogue in Chicago, as it is believed to come nearest to meet-

ing the general want of any method now in use. Markets competing directly with Chicago have aimed to grade as near like it as possible, and if this little work affords any aid in this direction, it will be a source of very great satisfaction to the publisher.

ALBANY INSPECTION.

This was originally divided into five qualities, viz: Clear, Fourths, Box or Selects, Common and Culls. Clear, or Three Uppers, was subdivided into three grades: First, Second, and Third.

First Grade. A First Clear board shall be perfect in all respects, free from wane, knot, rot, shake or check, not less than twelve feet long and eight inches wide, (in any case) unless a very wide and thick piece, when a minimum length of ten feet may be allowed.

Second Grade. Not less than twelve feet in length, unless very wide and thick with not more than two defects, *i. e.*, two sound knots which could be covered by a York shilling (dime), or sap equal to one inch on one side, or one knot and one sap; not less than ten inches wide, well manufactured, and free from rot, shake or check.

Third Grade. Not less than twelve feet long, unless very wide and thick, and ten inches wide, free from rot, shake or check, when three defects might be allowed; either three knots which a York shilling would cover, or two saps an inch wide, with one small knot. If very wide, the defects might be allowed slightly to increase,

but not so as to injure the general character of the piece. These three grades are included in one and designated Clear or Good.

Fourths. Not less than twelve feet long and twelve inches wide, with not exceeding four defects at that width, viz: if free from sap, four sound knots on the heart side, not larger than a dime; if free from knots, two saps which must not exceed two inches on each edge, and must be bright. At the minimum width, one face must be perfect; with increasing width latitude may be allowed to the extent of the sap.

*Select Box.** Not less than twelve feet in length and eight inches in width in any case. Must if narrow, have one perfect face, and may have small knots, not exceeding five, in a width of fourteen inches or more. Sap may meet on one end for not more than one-fifth the length, or two saps may be allowed on sap side, but must have at least three inches of heart wood between; sap must be bright; must be free from rot, shake and checks.

Box or Common. All sound lumber free from loose knots, shaky hearts, rot, shake and worm holes which

*In the early days of the trade, the grade Select was known as Box, while Sound Common was known as Merchantable.

is below the grades before named, shall be classed as Box or Common.

Pickings. A grade of common which in its general character will dress one side clear, or has no great number of small knots, but is suitable for finishing lumber. (A mighty good fine common, but indifferent select.)

Culls. Will not hold water, shaky, rotten, coarse knots, black and mouldy sap. If very rotten, embracing more than one-eighth of the board, it becomes a scoot, refuse or mill cull. Market culls must be good enough to make hog pens, board fences or roof boards.

Scoots, Refuse or Mill Culls. Lumber that is not worth removing from the mill, and is fit only to be burned.

MICHIGAN INSPECTION.

The Saginaw Valley became the most extensive producing section of the country from about the year 1850, it being in the hey day of its prosperity from about 1860 to 1875, during which periods its manufacturers approximated yearly shipments of from six to eight hundred million feet, and sales were ostensibly governed by Albany Inspection. The grade was of superior quality, and the question of Inspection became an important one. In order to secure as nearly as possible a uniformity in this regard, the manufacturers in 1873 obtained the passage of an Act of the Legislature, establishing in each organized County or other sub-division of territory, Inspection Districts, each having an officer known as Inspector General, with Deputies and Sub-Inspectors to be appointed by him. The details of this law, which was subsequently repealed, need not be given here, but the inspection presented by it, being somewhat in its governing principles, in force by reason of prevailing custom, will be of interest to lumbermen everywhere.

It will be observed that in the upper grades, particularly 1st Clear, it is more liberal than Albany, where-

fore it may be argued, that inasmuch as a large proportion of the better grades from Eastern Michigan find their way to Albany, and are subject to inspection there, the present custom at Albany conforms very nearly to the rules established in Michigan.

Allowance must be made for the fact that established usage in Saginaw does not fully conform to the law as written. In fact, under the operation of the law, it is presumable, upon good grounds, that it was never strictly adhered to. It is a noticable fact in all markets, that Inspection varies largely; with an advancing or declining market, it becomes more or less liberal in proportion to the demand and readiness of sale. This is one of the main difficulties in the way of prescribing Inspection rules, which shall always govern in all localities. At the same time it is manifestly unjust that a piece of lumber which will pass in a given grade under an advancing market, should rank in a lower grade in a duller market. Many Michigan Inspectors never took kindly to the law as it was written, and varied their Inspection to conform to their personal opinions and judgments, and since its repeal have continued to do so. The tendency of the law was to the side of leniency, favoring the seller rather than the buyer, and its repeal was presumably in accordance with pub-

lic sentiment, as expressed by the trade at large. It is, however, the only written exposition ever given for the guidance of the trade, and as such it is appended.

Synopsis of the Michigan Inspection Law of 1873.

Sec. 3. * * * * It shall be the duty of each Inspector General, Deputy and Sub-Inspector, in determining the quality and quantity of lumber inspected by him, to place the same in that class or quality as hereinafter defined, to which it approaches the nearest in description and value, at all times using the description of qualities contained in this act as the standard for comparison.

Sec. 9. All merchantable White Pine lumber shall be classified as follows, for purposes of Inspection: First Clear, Second Clear, Third Clear, Common and Shipping Culls; and boards six inches wide shall be known as Strips. Norway Pine shall be classified as Common and Shipping Culls, except as hereinafter provided.

Sec. 10. First Clear lumber shall be not less than eight inches wide, twelve feet long and one inch thick, and at such width, and up to ten inches wide, shall be free from all imperfections. If the width is twelve inches, defects shall be allowed that will equal knots

in the aggregate of one inch in diameter, or sap that will be equal to one and one-half inches on one surface. If the width is sixteen inches, defects shall be allowed that will equal knots in the aggregate of two inches in diameter, or sap that will equal two inches on one surface. If the width is twenty inches, defects shall be allowed that will be equal to knots in the aggregate of two and a half inches in diameter, or sap that will be equal to three inches in width on one surface. The Inspector shall take particular notice and shall allow a due proportion of defects for all pieces of widths between or above the given standard; also shall allow additional defects as the lengths increase above twelve feet long, in proportion to such increased dimensions. He shall also allow as follows in each of the three grades of clear lumber, viz: For each additional half inch in thickness, additional defects in proportion, that shall equal knots in the aggregate of one-quarter inch more in diameter, or sap that will be equal to one-quarter of an inch more in width. All pieces shall be well manufactured and of full thickness (all knots to be sound), and all sap to be free from black stain that is of such character that cannot be removed by dressing, and no piece shall be allowed with more than one straight split, and that not to be over one-fifth the

length of the piece, which shall be counted as one defect.

Second Clear. Shall be not less than eight inches wide, twelve feet long and one inch thick, and at such width, and up to ten inches wide, defects shall be allowed that will be equal to knots in the aggregate, of three-quarters of an inch in diameter, or sap that will be equal to three-quarters of an inch in width on one surface. If the width is twelve inches, defects shall be allowed that will be equal to knots in the aggregate of one and a half inches in diameter, or sap that will be equal to three inches in width on the edges. If the width is sixteen inches, defects shall be allowed that will equal knots in the aggregate of two and a half inches in diameter, or sap that will be equal to four inches in width on the edges. If the width is twenty inches, defects shall be allowed that will be equal to knots in the aggregate of three inches in diameter, or sap that will be equal to five inches in width on the edges. A straight split shall be allowed in this quality as before provided in boards of the width of twelve inches or over, and be counted as one defect.

Third Clear. Shall not be less than seven inches wide, twelve feet long, and one inch thick, and at such width, and up to ten inches, defects shall be allowed that will be equal in injury to a knot one and one-half

inches in diameter, or sap that will be equal to one and one-half inches in width on the best side. If the width is twelve inches, defects shall be allowed that will be equal in injury to a knot of two and one-half inches in diameter, or sap that will be equal to two and one-half inches wide on the best side. If the width is sixteen inches, defects shall be allowed that will be equal in injury to a knot of four inches, or sap that shall be equal to four inches wide on the best side. If the width is twenty inches, defects may be allowed that will be equal in injury to a knot five inches in diameter, or sap equal to six inches on the best side, but sap in no case to exceed one-half the surface on the poorest side. In this quality shall be included pieces ten feet long and not having more than their due proportion of defects; also all pieces six inches wide and more than one inch thick, with not more than two small, sound knots, or sap not more than one inch in width on one side.

First Clear Strips. Shall be six inches wide, one inch thick, and not less than twelve feet in length, and free from all imperfections.

Second Clear Strips. Shall be the length, width and thickness of First Clear, and may have two small, sound knots, or if no knots then sap equal to one inch in width on one edge of one side.

Third Clear Strips. Shall be of the width and thickness of First Clear Strips, and may have three small sound knots, with sap one inch on one side; but if no more than three small, sound knots, then sap equal to two inches on one side may be allowed; to be free from rot, shake or split. 1st and 2d Norway Strips of full width and thickness, and 1st and 2d Clear White Pine Strips, ten feet in length, also 1st and 2d Clear Strips rejected on account of thickness, and not less than five inches wide, shall be classed in this quality.

Common Lumber. Shall include all Boards, Planks, Scantling, Strips, Joist, Timber, and lumber not otherwise defined, which is not as good as Third Clear, but is generally of a sound character, well manufactured, of full thickness, and free from large, loose knots and bad shakes, that show on both sides of the piece. Scantling, Joist and Timber must be free from imperfections which so weaken the piece that it cannot be used for substantial building purposes. Scantling, Joist and Timber made from worm eaten logs, and pieces with a small streak of rot, when not so badly damaged as to render the same unfit for ordinary uses of common lumber, shall belong to this quality. One straight split shall be allowed, provided it does not

exceed one-quarter the length of the piece. Pieces that have not more than two auger holes, which are placed near the end of the piece, shall be allowed in this quality, provided they are measured in lengths of even number of feet between said auger holes, and conform in all other respects to the requirements of this quality. No lumber under ten feet in length shall be considered as merchantable.

Shipping Culls. Shall constitute the lowest grade of merchantable lumber, and shall include all lumber not as good as Common, which can be used for ordinary purposes without a waste of more than one-half.

Mill Culls. Shall include all lumber not as good as Shipping Culls. A board or plank over twelve inches in width, of which one end shall be wider than the other, shall be measured at a point one-third its length from the narrow end, to determine its width, and all such boards or plank less than twelve inches in width shall be measured at the narrow end. All lumber over ten feet, up to and including twenty feet, shall be measured in lengths of even number of feet, and all over twenty feet long, each additional foot shall be counted, unless otherwise agreed between buyer and seller. No fractional part of a square foot shall be counted except in the measurement of joist, scantling or timber.

Sec. 11. Merchantable lumber may be measured and inspected in either of the three classes following, viz: The first class shall be an inspection of the lumber in the five qualities aforesaid.

The second class shall be an inspection of the lumber in three classes, of which the first, second and third class shall form one, which shall be denominated Uppers, and the other two shall be Common and Shipping Culls as aforesaid.

The third class of inspection shall be in one quality which shall include the five qualities first mentioned, and shall be denominated Straight Measure.

SAGINAW INSPECTION.

While the preceding chapter reproduces the enacted law which for three or four years prescribed what should be the rule of inspection in the state of Michigan, it is an undeniable fact that Saginaw was a law unto itself, and while ostensibly working under the provisions of the written law, the inspection of that section was in reality unchanged from preceding systems, to which customs the inspectors mainly adhere to-day.

The same designations of Good, or Uppers, Selects, Common and Culls are retained, or lumber is sold, log run (mill culls out) as prescribed in the last section of the defunct law. The main difference between the old Michigan law and Saginaw Inspection proper, is in the former being more in favor of the seller, while the latter is in favor of the purchaser of lumber, and the difference is confined to the higher grades.

The difference may be noted as follows: In the three uppers the Albany rule is more nearly adhered to.

First Clear. Is not less than eight inches in width, and is free from imperfections, the term Clear implying freedom from defects.

Second Clear. Not less than eight inches in width, at which it must be so nearly perfect as to fall but a trifle short of First Clear. As the width increases, a larger range of defects may be allowed, so that at twelve inches wide, a piece may have two knots of one inch diameter, or two narrow saps on one side; at sixteen inches wide, especially if the piece is more than one inch thick, two knots may be allowed, or one knot and one sap not over one and one-half inches in width. At twenty inches in width the two knots may be larger, or the saps may widen to one and one-half inches.

Third Clear. Is supposed to admit of three defects, but up to ten inches, knots should not exceed three-quarters of an inch in diameter, or sap not exceeding three-quarters of an inch on one side. With increasing width knots may increase to three in number, not exceeding in size one inch each, or sap equal to one and a half inches in width on two edges of one side; with narrower saps a small knot showing on the face side might be allowed; but as a rule the three upper grades demand one perfect face. As in all other markets, the inspector is supposed to exercise a wide range of judgment in the inspection of the three uppers. A plank two inches thick and thirty inches wide will admit of a more lenient judgment, as regards defects in

size and number, than a piece of half that size or of one inch thick.

A piece of soft cork pine, of free grain and generally handsome appearance, must not be judged with equal harshness with a piece of glassy texture, tough grain and unfavorable appearance.

An experienced inspector will in all cases judge of a piece of lumber from the standpoint of the location of its defects, and the general utility of the piece. While not more than three defects should as a rule be included in the three upper grades, no one will deny that a wide plank with even five knots located near one side, or even some of these showing through to the face, but where perhaps four-fifths of the plank is "clear as a hound's tooth," is deserving of classification in this grade. In reality, the inspection of lumber in uppers consists in defining what constitutes Third Clear, as, in practice, First and Second Clear is ignored, and the number and character of the defects which may be passed in Third Clear, determines the character of the Three Uppers. But in Saginaw and some other markets the term "Good" is used in designating the upper grades, and purchases are sometimes made in "Good," "Fourths," "Box," Common and Culls; yet, unless these terms are specified, the quality "Good"

in common use will include not only the Three Uppers, but as well the next grade below, or Fourths.

Fourths. As the term implies, allows of four defects in a piece of lumber. Four knots the size of from a dime to a quarter of a dollar, according to the size of the piece, or two saps on one side, which at twelve inches wide, should not exceed three inches in the aggregate, or embrace more than one-quarter of the sap side, the heart side being a face. With increasing width the proportion of sap may increase, or with narrow saps, the face side may have some knots. The general description of this grade, however, is of a class of lumber which has four defects, of such character, as, while condemning it for the Three Uppers, yet marks it as suited for many or most uses to which the Three Uppers may be put; the fact that it is combined under the term Good, with the Three Uppers, showing it to be more nearly allied to them than to the lower grades. Fourths were originally known as the dividing grade between the Three Uppers and Common, and the designations were Good, Fourths, Common and Culls. When, however, it became incorporated with the Three Uppers, and was included in that designation, (as it has practically become) the grade Selects which had hitherto classed with the Common, was admitted

to the code, and consisted of what had hitherto been looked upon as raising the Common to a higher standard of excellence.

Selects—known as Select Common, or Select Box, or where the designation is thoroughly known, Box, is a grade of lumber suitable for finishing purposes, yet having too much sap on one side, or too many knots on the other, to admit its entry to the grade of Fourths. Selects are usually taken from the lumber cut next to the outside of the log, sometimes known as sap boards, the general character of which is to give one face side, while the other is largely covered with sap, which if properly piled, so as to dry bright without stain or mould, is adapted to a large proportion of the finer work where one side only is exposed to view. With this point in mind the inspector will allow knots in this grade proportioned to the size of the piece. If the sap is narrow the face may have one or two small knots, but, except in wide lumber, the rule is observed "one side a face." Selects are seldom accepted below eight inches in width, and at that width the defect is in sap, which may embrace not more than one-third the sap side and must not run on to the face side. Or a board of that width may have a good sap side, nearly if not wholly clear, and one or two small knots on

the heart side. In larger pieces a board or plank having too many defects for the grade of Fourths, and yet approaching almost to the requirements of that grade, is included in the Selects. A board sixteen inches wide, one inch thick with five knots the size of one inch, and no other defect, would be classed with Selects. The same piece at 1¼ or 2 inches thick would probably by most inspectors be classed as Fourths. A board twelve inches wide, with a perfect heart side, and the bright sap covering half or more of the sap side, would be a Select. If the saw had skimmed the sap side a quarter inch deeper, so as to reduce the sap one-half, the piece would be called a Fourth. Sap covering the one side wholly, even though not coming on to the heart side, would reduce the board to Common, unless in markets where "Picks" are known as a grade. They are not known in Saginaw, and go to enrich the Common, and afford perquisites to the retailer. This in fact may be said of the custom at all Michigan and Wisconsin points. Shaky lumber is not admitted in this or the upper grades.

Strips, First Clear. Are six inches wide, and one inch thick, and free from all imperfections, and are known as clapboard or siding strips. The term siding strips should not be confounded with "Sidings" or

lumber cut from the side of a log, in distinction from the stock, or lumber cut from the squared log.

Strips, Second Clear—Approaches A Flooring, Chicago yard grading. Six inches wide, one inch thick, and may have two small, sound knots, or if no knots, then sap equal to one inch in width on one edge of one side.

Strips, Third Clear—Nearest to B Flooring, Chicago yard grading. Six inches wide, one inch thick, and may have three small sound knots, and upon one side in addition, sap equal to two inches in width. All strips in these three grades must be free from rot, split or shake.

Norway Strips answering to the description of First and Second Clear, and ten feet or more in length, are included in this grade when sold as Norway.

Strips, Flooring and Fencing. Include all strips not as good as Third Clear, yet free from rot and split. Flooring strips must be of full thickness and width, except where a narrower width is desired, when they may be of the uniform width of three, four or five inches. All knots in flooring strips must be of a sound character. Fencing strips include all coarse grade strips not good enough for flooring, and above the grade of culls, or strips not up to the standard

thickness, and their inspection is less rigid than in the other grades.

Common. The term common includes all boards, plank, scantling, strips, joist, timber and lumber not otherwise defined, which does not come up to the standard of Select Box, but is of a generally sound character, well manufactured, of full thickness, and free from large, loose knots, and bad shake. Scantling, joist and timber must be free from knots or imperfections which involve or weaken the piece for substantial building purposes. Worm holes and small rot streaks, in extent not materially to damage the piece for the uses in which its size is usually employed, belong to this quality. One straight split, not more than one quarter the length of the board, *may* be allowed. Auger holes (almost unknown in Saginaw) are to be excluded, by measuring in even feet between the holes. No lumber under ten feet in length is considered as merchantable in this or the better grades.

Shipping Culls. Unsound knots, or knots which affect the strength of the piece, black or mouldy sap, unsound hearts, bad splits, badly sawed lumber in wedges or tarves (uneven edges), where the piece is yet available for coarse use, and all lumber not up to the grade of common, is included in this grade. Any-

thing poorer than shipping culls is not recognized in any market.

Saginaw lumber is always manufactured in twelve, fourteen and sixteen feet lengths (with an exceptional log of other lengths) in all grades, except dimension stuff, where lengths are cut to suit the sizes demanded, but the sidings from such logs are usually cut off to the twelve, fourteen and sixteen foot standard.

The thicknesses of the Saginaw lumber, as usually cut, is 1 inch, 1¼, 1½ and 2 inches, but with some 3 inch in coarse plank for road or paving purposes, or in extra nice stock, for thick uppers or deals. All lumber is manufactured in parallel widths, and many mills employ cut-off tables for reducing all lengths to uniformity.

The coarser grades are almost uniformly cut one inch thick, the better grades almost invariably in the one and one-half and two inch thicknesses. The Saginaw district supplies a larger proportion of the finer grades of white pine, than any other portion of the West.

CHICAGO CARGO INSPECTION.

Adopted by the Lumberman's Exchange.

This may be termed a modification of the combined Albany and Saginaw Inspections. It is observed in the sale of cargoes on the Chicago wholesale market.

Sec. 1. First Clear and White Pine Lumber shall be not less than twelve inches in width, and no imperfections allowed unless fourteen inches wide or upwards; will then allow imperfections equal to sap, one inch on one side, extending the whole length of the piece, on pieces fourteen inches wide and well manufactured, but the face side must be perfect; as width increases, will allow larger imperfections in proportion to the width, but not imperfections enough to decrease the value below the above described piece.

Sec. 2. Second Clear White Pine Lumber shall not be less than ten inches wide and perfect up to eleven inches in width; will then allow imperfections equal to sap one inch on one side of the whole length of the piece, if well manufactured; as width increases, will allow other and larger imperfections in proportion to the width, but not imperfections enough to decrease the value below the above described piece.

Sec. 3. Third Clear White Pine Lumber shall not be less than nine inches in width, and perfect up to ten inches; will then allow imperfections equal to sap, one inch on one side of the whole length of the piece, if well manufactured. The imperfections of this quality shall not exceed 100 per cent. over those allowed in Second Clear.

Sec. 4. Select White Pine Lumber shall include all lumber poorer in quality than Third Clear, the imperfections of which shall not exceed 100 per cent. over those allowed in Third Clear.

Sec. 5. Clear White Pine Flooring shall be one inch thick, six inches wide, and no imperfections.

Sec. 6. Second Clear White Pine Flooring shall be in thickness and width same as Clear Flooring, and will allow of one small knot or sap three-quarters of an inch on one side, with clear face.

Sec. 7. Common White Pine Flooring shall be of the width and thickness of First and Second Clear Flooring, and may have three small, sound knots, with sap one inch on one side, but if less than three knots, then sap equal to two inches on one side, and shall be free from rot, splits and shakes. Four inch flooring strips, equal in quality to First and Second Clear Flooring, shall be classed as Common six inch flooring.

Sec. 8. Common Pine Lumber includes all boards plank, joists, scantling, timber, fencing, and four inch strips that are of generally sound character, well manufactured, and not included in the foregoing qualities. Boards and plank should be square-edged, full thickness, and have no large loose knots or bad shakes. In wide boards, twelve inches and over, will allow a straight split one sixth the length of the piece, when otherwise sound. Fencing should be of good, sound character—pieces that will not break easily, six inches wide and one inch thick. Scantling, joist and timber should not have imperfections that would weaken the piece so that it cannot be used for substantial building purposes, and be uniform in width and thickness. Lumber should be measured at the small end, and if much wane on the piece, reasonable allowance made for it.

Norway Pine Lumber shall be classed as common lumber, unless otherwise agreed upon. Cargoes of piece stuff or timber containing over twenty-five per cent. Norway, shall not be considered standard, and all edge boards and inch lumber in cargoes of piece stuff, shall be subject to special agreement.

Sec. 9. All badly stained white pine lumber, that is otherwise better than common, shall be inspected into a lower grade than when bright and free from stain.

Sec. 10. All lumber described in the foregoing Rules of Inspection, shall be not less than one inch in thickness, and not less than twelve feet long.

Sec. 11. Culls. A quality that cannot be received into any of the foregoing, consisting of even lengths, of ten feet and upwards, and so imperfect as to be unfit for ordinary uses without waste.

Mill Culls. Refuse lumber.

Sec. 12. All cargoes sold under straight measure shall consist of lumber twelve feet and over; and where, by imperfection of manufacture, such lumber is reduced in grade so as not to answer the purpose for which it was intended, it shall be measured at only one half the amount in the piece for which it was intended. And all pieces containing auger holes. if fourteen feet in length and over, and bored only at the ends, shall be measured in full, excluding two feet in length of the piece; if bored in the center, it shall be measured for only one half the amount in the piece. All lumber less than twelve feet, to be subject for special contract between the parties. Mill Culls excluded in all cases. All boards and strips to be at least one inch thick; joists or scantling two or three inches thick.

Sec. 13. Shingles—Pine or Cedar, Sawed or Shaved, Warranted A or Star, shall be sixteen inches in length,

not less than three-eighths of an inch thick at the butt, and none less than three inches in width—all perfect. Number One—shall be sixteen inches in length, and not less than one third of an inch in thickness; may admit of forty shingles in a thousand, if perfect, less than three inches in width, or the same number of clipped, clips not to exceed three inches. All shingles to be smoothly sawed or shaved, and packed in good order.

Culls—are a quality manufactured from winding, wormeaten, shaky or dry-rot timber, badly manufactured or less than sixteen inches in length.

It is recommended that one quarter thousand bunches be packed in bands twenty inches in length, with twenty five courses; one-half thousand bunches in twenty-five inch bands with forty courses. Shingles shall always be full count, and pay shall be collected only for the number of shingles actually delivered, regardless of the pretended number contained in each package or bundle; or, in other words, there shall be exacted in every instance for one thousand shingles, the equivalent of one thousand pieces four inches wide.

Sec. 14. Lath—Number One—should be four feet (no more, no less,) in length; not less than three-eighths of an inch thick, and one and one-half inches wide, free from shakes, rot, wane, or worm-holes.

Number Two—same length as No. 1, may be less than three-eighths of an inch thick, and must be not less than one and one-quarter inches wide, will admit of wane and worm-holes not to exceed ten pieces in a bundle of one hundred.

Culls—All that will not pass in the above-named qualities.

CHICAGO YARD GRADING.

The system of grades prevailing among the yards of Chicago, is a most difficult thing to describe, yet a general similarity of ideas is supposed to prevail among all dealers. We therefore endeavor to give the general laws govering their grading.

First Clear. Shall not be less than twelve inches in width and twelve feet long (except that in some yards ten foot pieces are admitted in the upper grades, the majority adhering to the twelve foot standard), and with no imperfections, unless the piece is fourteen inches or over in width; will then allow imperfections equal to sap, one inch on one side, extending the whole length of the piece, but the face must be perfect. As the width increases, will allow larger imperfections in proportion to the width.

Second Clear. Shall be not less than eleven inches wide, and must be perfect up to eleven inches. Above eleven inches, imperfections may be allowed equal to sap one inch on one side of the whole length of the piece if well manufactured. With increasing width will allow other and larger imperfections in proportion to the width, but not imperfections enough to decrease

its value beyond the standard of a twelve inch piece of above description.

Third Clear. Shall not be less than nine inches in width (except as below), and perfect up to ten inches; will then allow imperfections equal to sap one inch on one side of the whole length of the piece if well manufactured. This grade, however, is subject to modification in that while it is mainly the equivalent of Albany Thirds and Fourths, it may generally be found to combine the grades of A Box, A Stock and 8-inch A, varying from standard inspection by allowing a minimum width of nine inches and a length of twelve feet. In yard grading, knots as big as a half dollar may be allowed in a fair sized piece, as to general location and effect upon the use of the board. Smaller knots, as high as five in number, or bright sap on each edge of one side, two inches in width. In narrow boards, one face must be nearly perfect except 8-inch A, where the general rule applies modified by the width. A stocks, usually refers to 12-inch, but may apply to 10-inch Stocks when so specified.

A Box and A Stocks usually range in price with Third Clear. Eight-inch A, although of the same general quality, ranges from $3 to $5 lower in price. Ten-inch Stock in all grades usually ranges $2 below 12-inch.

A Selects, B Box, B Stock, Eight-inch B. These are all of about one grade, and are taken from Third Clear and Selects, what may be called "line boards," between the two grades.

A Selects are properly a grade below, although some claim to make it equal to 3d Clear. In this grade, some yards will allow shake, where the use and general value of the piece is not seriously impaired thereby. As a rule, however, no shake is admitted. Knots may be allowed according to size of board and location of knots, but seldom both knots and shake. Widths may run from 8-inch upward. Sap may be allowed equal to two inches on one side of a nine inch piece, increasing with the width. The term "Box" is applied to all grades, where the width makes the lumber suitable for cornice and shelving, or wagon-box boards, from which latter the Chicago use of the term is derived. Sample boards may be described as follows: A board twelve feet long, twelve inches wide, had one knot the size of a dime, one cat-face knot, two saps on one side, of which one is narrow, running the whole length, the other three inches at one end, tapering out at four feet. Some call this a *fair*, others a *good*, A Select.

B Box. Is thirteen inches wide and over. A board seventeen inches wide, sixteen feet long, with twelve

medium knots; another sixteen inches wide, two saps of two inches each on one side and ten small knots on the other, were seen in a pile of B Box, but were criticised by other graders.

B Stock is usually twelve inch, but may include ten inch stocks. Eight inch B is of parallel width (7½ to 9) up to grade, in proportion to width.

B Select in general character is a sap board; if narrow, one side may be well covered with sap, no knots on the face. Such a board may be from seven to ten inches. At ten to fourteen inches, some knots and less sap. This class makes good "one side" lumber for finishing boards, and in general, knots may be allowed of a character not to injure the board for finishing purposes or for cutting up. A sample board seven inches wide had bright sap nearly covering one side, the other a face. Another of thirteen inches had but four inches of meat on the sap side, the sap came through to the face, and there were two small knots on the face. Another of nine inches had sap covering one end for five feet, sap ran slightly on to the face of the board. B Select on wider pieces may combine some considerable shake at the ends, if the center is good, or on center if the ends are good.

The sap in this grade should be judged in the mat-

ter of color by its surroundings. While a black sap is scarcely allowable, a simple discoloration will not condemn the piece if all other requisites are present. A piece of fair width with one clean face to work would admit of a blacker sap on the outside of the cut. In this grade also may be admitted a class of soft wide lumber, with large or even loose knots, where the cuts between the knots may give a large proportion of finishing lumber. Such lumber is often found where the rules of regular and strict inspection would condemn a piece to the grade of cull, yet where the piece is of especial value for cutting up.

Common. All good sound lumber ten feet long and upwards, however knotty, if the knots are tight and sound and not coarse enough to weaken the board, are included in this grade. Also sap boards, when the sap is fairly bright. Boards free from rot and shake, which involve their usefulness, are common boards. Lumber which will make a water-tight roof is in all markets included in this grade. *Splits or Checks, if straight and not of an extent or nature to materially injure the board, are generally allowable. The lumber must

* Bad Splits and Checks, especially when not straight, will always condemn a board of any grade to a lower one, according to the effect upon its usefulness. The same is true of waney edges.

be of full standard thickness and well manufactured.

Worm-holes *may* be permitted in this grade in number and character proportioned to the size of the piece, but as a rule, wormy lumber should be excluded as Culls. Custom has allowed common plank, measuring $1\frac{7}{8}$ thick, to be measured as if full two inch. A few worm-holes are not objectionable in dimension stuff unless enough in number to weaken the piece, or of a generally unsightly character.

C Box is a grade of thirteen (13) inches wide and over, with small, sound knots.

D Box is simply good, wide Common.

Neither of these last two pretend to any grading above Common, except that their widths adapt them to special uses.

Culls. Unsound lumber, loose knots, bad, black knots, or large, coarse knots, loose or shaky hearts, unedged or waney, and badly shaky lumber, black sap stain, especially if mouldy. All wormy lumber, rotten streaks, or ends badly manufactured as to thickness, wedge boards or tarved lumber (thick on one edge and thin on the other), or boards which wont hold water. All the above properly belong in Culls, and when unfit to be used as roofing to nail shingles on, or is generally unsightly in appearance, it is known

as "Scoots," Refuse, or Mill-Culls, and has no quotable value.

Lengths. In some yards ten feet is the standard of length, and all lumber is measured in even figures of ten, twelve, fourteen, sixteen and eighteen feet; odd lengths are unknown unless in special orders and in lumber of over twenty feet. Until within the last two years twelve feet was the minimum of length in a merchantable piece of lumber, and most yards yet adhere to this rule. All lumber of less than ten feet is unsalable, except when in quantities, as it is often found in irregular lengths at gang saw-mills, when it is known as "clips." This is sometimes sorted as to quality, but has no classification; it is usually sold as a bulk, either by the pile or by straight measure, and is often of a desirable character for builders.

Widths and Thickness. The wider a board is the more latitude is allowed for defects. This remark applies generally to lengths, widths and thickness, although as a rule, unless a board holds plump to an intended thickness, it is measured to the next standard below. *In dimension or bill stuff such as joist, scantling or timber, a variance in thickness is almost uni-

*We would call attention to the table on page where is shown the sizes and measurements in vogue in the Chicago market.

versally allowed by dealers and consumers, although strict rules of inspection demand full sizes in all respects.

In wholesale markets a board measuring a half inch or more over a certain width is measured at the next lower number. In retailing, however, the half inch is properly counted, while in some markets the "give and take" principle is observed; that is, if a full half inch or over, it is called at the next higher figure; if not full half inch it is called back to the last full figure.

Stock Boards. A class of lumber sawed of a uniform width of ten, twelve and fourteen inches. It is graded the same as other lumber, but its uniformity marks it as of superior utility for ripping into flooring, siding, etc., or for manufacturers requiring large quantities of certain widths for special work. The lower grades are mainly used as barn boards, or for coarse sheathing, and other similar purposes.

Other Varieties. Norway mixed with other lumber uniformly classes as common; but when in lots by itself, may be graded in a manner similar to white pine, the designation "Norway" indicating its distinctness from white pine.

Flooring, siding and ceiling are graded according to the general rules applying to wider lumber, modified

to suit the decreased width, but are measured as the piece was in the rough.

In general. As before remarked, no specific law can be laid down by which an inspector or grader can be absolutely governed, but by these general points the grader may be assisted in deciding which of the classifications a piece of lumber approaches the nearest to, all the surroundings, character of the timber, its size, length, thickness, and general adaptability being taken into consideration. Any points not touched upon under the head of yard grading, are supposed to be fully governed by the rules of the Lumberman's Exchange for cargo inspection; where these are lacking in detail, the Michigan inspection law is considered standard authority.

CHICAGO HARDWOOD INSPECTION.

The Chicago rules of Hardwood Inspection do not materially differ from those in vogue in other localities, although, as in the case with pine, there are many points which are the subject simply of judgment, and cannot be defined even in conversation, inasmuch as scarcely any two pieces of lumber are exactly alike, and each piece must be the subject of an individual and distinct opinion. The ensuing description has been carefully revised by the leading dealers in hardwood in Chicago and meets with their approval as laying down the general rules and practices of this market.

The forest products embraced in the term Hardwood, as known to the trade, include Poplar or Whitewood, White Ash, White and Burr Oak, Hickory, Black Walnut, Cherry, Butternut, Hard Maple, Soft Maple, Basswood, Hickory or Rock Elm, Sycamore, Sweet Gum, Chestnut, Red Cedar, and Southern or Yellow Pine.

Poplar. Should be in even lengths of twelve, fourteen or sixteen feet; anything shorter must be very good and submit to an allowance in price. The prin-

cipal thicknesses are ½ inch, ⅝ inch, ¾ inch, 1 inch, 1¼ 1½, 2, 2½, 3, 4, 5, and 6 inch. Squared should be 4x4, 5x5, 6x6, 7x7, 8x8, 9x9 and 10x10, and should in all cases be ⅛ inch over these sizes to allow for shrinkage in drying; ½ and ¾-inch. are special sizes.

The Inspection grades are Clear or No. 1; Second Clear or No. 2; Common or No. 3; and Culls.

First Clear, or No. 1. Must be twelve inches or more in width, and free from all defects. The squared pieces are exempt from this rule only as to width. Plank from 1¼ inches in thickness may be of a width of ten inches. Bright sap not over two inches would be allowed in this grade.

Second Clear, or No. 2. May be eight inches wide and upward, but at ten inches may have from one to three sound knots. If a piece is wide, a little white sap may be allowed on one side. All narrow, perfect pieces of eight inches are placed in this class. Defects are counted upon the basis of a knot the size of an English walnut (about 1¼ inch diameter), with an allowance of more defects in proportion to increased width. Splits will always drop a board into the grade below.

Common, or No. 3. May be of any width or thickness. Will allow of discolored sap, sound knots, be-

yond those described in No. 2, and wide saps. In narrow pieces, not more than three knots will be allowed. Defects may increase in number and extent as the width increases, but all lumber must be sound.

Culls. All widths and sizes having more defects than described in Common, whether in the number or character of the knots, discolored sap, badly checked, and generally such lumber as is unfit for ordinary purposes without waste.

WHITE ASH.

White Ash should be in lengths of twelve, fourteen and sixteen feet, and the usual thicknesses are 1, 1¼, 1½, 2, 2½, 3, 3½ and four inches. It is inspected in Nos. 1 and 2 combined, and Cull, price being made as to character or preponderance of the better or poorer. Sap is not considered a material injury. Ash lumber is to be eight inches wide and over; at eight inches defects may be allowed equal to two small hard knots, 1¼ inch being taken as a standard. Must be free from hearts and dry rot. All sizes must be ⅛ plump, or will be reduced in grade and price. Wagon tongues should be cut from tough timber, butt logs, and be free from defects of any kind, especially cross grain; length,

twelve feet; size, 2x4 at one end by 4x4 at the other, and 2½x4½ at one end by 4½ square, plump, at the other. Splits reduce one grade.

Cull Ash. Includes all defective lumber, hearts, shakes, knots beyond standard, dead or doty timber, and defective sawing.

Ash Flooring. Should be four and six inches wide, with one face and two edges clear; thickness, 1 and 1¼ inches; lengths, twelve, fourteen and sixteen feet.

WHITE AND BURR OAK.

Lengths should be twelve, fourteen and sixteen feet. Sizes 1, 1¼, 1½, 2, 2½, 3, 3½, 4 and 4½ inches. Shorter lengths may be allowed, but are subject to an allowance in price.

It is inspected as Clear, Second Clear, Common, Culls, and Wagon Stock. Some yards do not make the grade of Second Clear, that grade enriching the Common.

Clear. Must be eight inches wide and over, free from all defects.

Second Clear. At eight inches wide will allow from one to three small sound knots, of the 1¼ inch standard, or a little bright sap. No other defects are allowed

in this grade, but their extent may increase with the size of the piece. Splits always reduce one grade in oak as well as in other hardwoods.

Common. Must be free from shake and worm holes; may have sound heart in thick plank. All knots must be sound.

Culls. Bad heart plank, wormy or generally unsound lumber.

Oak Flooring. Should be four and six inches wide, with one face and two edges clear; thickness 1 and 1¼ inches; lengths, twelve, fourteen and sixteen feet.

OAK WAGON STOCK.

Bolsters. Should be four feet and four feet six inches, or the multiples thereof in length. The sizes run 3x4, 3½x4½, 3½x5 and 4x5.

Reaches. Require plump thickness, 2x4 and 2½x4½. Lengths, eight, ten and twelve feet, clear of imperfections.

Harrow Timber. Thickness, 2½x2½ and 3x3 plump. Lengths may be five, ten, twelve and fourteen feet.—Must be clear of imperfections.

All stock should be sawed ⅛ plump, and bolsters should allow 3 inches for check in seasoning.

HICKORY WAGON STOCK.

Hickory may be classed as Boards, Plank and Axles.

Boards and Plank are inspected as *First* and *Second Clear*, in one grade.

The lengths are ten, twelve, fourteen and sixteen feet; the thickness 1, 1¼, 1½, 2, 2½, 3 and 4 inches.

The combined grade will not admit of more than one or two small sound knots of the 1¼-inch standard, and no other imperfection. Sap is excluded from yard piling and grading from its liability to powderpost in seasoning.

Axles. Lengths are six and twelve feet. Sizes, 3x4, 3½x4½, 4x5, 4x6, 4½x6 and 5x6. Must be sawed plump, ⅛-inch full, and perfect in all respects.

Hickory should never be cut between the first of February and first of September, while the sap is rising.

Culls. All lumber not up to the preceding grades.

BLACK WALNUT.

Lengths may run twelve, fourteen and sixteen feet, but as short as eight feet is taken if otherwise up to grade, with due allowance as to price. The usual

thicknesses are $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, 4 and 5 inches.—Width is a desirable point in walnut.

It is handled in Nos. 1 and 2 combined.

No. 1. Must be not less than eight inches in width, and must be free from all defects.

No. 2. Must be not less than seven inches wide, and at seven inches may have a little sap, or two small knots of not over a 1-inch standard. Defects may increase with the width in proportion.

Common. All not up to the standard of No. 2, but available in its full size without waste.

Culls. Any width, not good enough for common, in which not less than one-half the piece is fit for use without waste.

Walnut Flooring. Is one inch in thickness and four and six inches in width. The 6-inch allows for splitting into narrower, when dressed, without the risk of warping in seasoning, which would destroy the value of narrower sawed stock. Must have one face and two edges clear.

Newels. Should be cut outside the heart, to square 5, 6, 7, 8 and 9 inches when seasoned. Their length should be four feet or the multiples thereof, and they must be free from all defects; curls rightly located are not considered defects.

Balusters. Should be cut exactly square, 2x2, 2¼x2¼, 2½x2½, 3x3 and 4x4, and a full 1-16 plump. Lengths, thirty and thirty-two inches. Must be free from all defects, especially sap and shake.

Counter Tops. Are twelve, fourteen, sixteen and eighteen feet in length, twenty inches and over in width, and strictly Clear. The longer lengths are the most desirable.

In fourteen and sixteen feet lumber, ends may be cut where a twelve-foot length can be obtained.

CHERRY.

The Inspection is in grades of First and Seconds, and is the same as in Walnut and the same rules apply. Thickness may be 1, 1¼, 1½, 2, 2½, 3, 4 and 5 inches. Lengths, twelve, fourteen and sixteen feet. Widths, eight inches and over. Cherry flooring, newels and balusters same as Walnut.

BUTTERNUT.

Same as Walnut and Cherry, in grades of Firsts and Seconds. Lengths, twelve, fourteen and sixteen feet. Thickness, 1, 1¼, 1½, 2, 2½ and 3 inch. Widths eight inches and over.

HARD MAPLE.

Is inspected in a combined grade of Firsts and Seconds.

Lengths may run twelve, fourteen and sixteen feet. Thickness, 1, 1¼, 1½, 2. 2½, 3, 4 and 4½ inches. It must be not less than eight inches wide, at which one small (1¼ inch) sound knot may be allowed, but no other defect in the first grade. Increased defects may be allowed with increased widths, if located so as not to injure the cutting of sizes for which each thickness is adapted. Some yards divide into Clear, Common and Cull. The Clear must be ten inches and over, and free from all imperfections. Splits will reduce one grade in each quality.

Common. May be from six inches upward, with imperfections which will not render the piece unavailable for ordinary uses without waste. Not over two or three small knots, without shake, will be allowed in the grade.

Culls. Include all heart shakes, badly sawed, or other defects, from which the piece is not good enough for common, but in which one-half the piece will work up without waste.

Flooring should be cut from the outside of the log

from the white timber, the red timber of the heart wood, being less valuable, and should be cut in four and six inch widths, 1 and 1¼ inch thickness, mostly one inch.

SOFT MAPLE.

Is but little in demand, but Inspection is the same as in Hard Maple.

BASSWOOD.

Basswood is used in lengths of twelve, fourteen and sixteeen feet. Thicknesses are 1, 1¼, 1½ and 2 inches, the demand being mostly for one inch. Widths may be eight inches and upward. Edges should be square as in Pine. It is inspected in the two grades of Good and Cull.

Good. Includes all perfect lumber free from shake, black knots and hearts. Small sound knots, from one to five in number, do not condemn it for this grade.

Culls. Includes all lumber not good enough for the preceding grade. As in Pine, a board which will not work at least one-half its size without waste, is a mill cull, and has no market value. An inordinate number of knots will in basswood, condemn a piece to the grade of culls.

HICKORY.

Hickory or Rock Elm is used in lengths of twelve, fourteen and sixteen feet, and in thicknesses of 1, 1¼, 1½, and 2 inches. The inspection is in Good and Culls.

Good. Comprises lumber free from hearts and shakes; small, sound knots from one to five in number, do not condemn it.

Culls. Comprise all below the grade of good, when at least one-half the piece will work without waste.

SYCAMORE.

Same as Hickory or Rock Elm.

SWEET GUM.

Is inspected the same as Black Walnut. Lengths, twelve, fourteen and sixteen feet; thick ness, 1, 1¼ and 1½ inches. The demand is mostly for one inch, eight inches wide and over.

CHESTNUT AND CEDAR.

Same as Sweet Gum and Black Walnut.

SOUTHERN OR YELLOW PINE.

In Southern or Yellow Pine this market demands only the best quality, the plentifulness and cheapness of White Pine effectually excluding all of the coarser grades of Yellow Pine. Our remarks, therefore, apply to the better qualities of Georgia and Florida Pine, or lumber from sections supplying the same character of timber.

It is inspected as First and Second Clear, in thickness of 1, 1¼, 1½ and 2 inches. The combined grade will admit of one or two small sound knots; must be free from other defects.

Flooring Strips. Are of four and six inches in width, with one face and two edges clear.

The Hardwood Inspection of Chicago differs but little from that in vogue in other localities. It has been our aim in describing the different kinds of timber, to at once afford a clew to the dealer, as to the designations or terms used in the trade at Chicago, and to afford a guide to the mill man in cutting his logs, as to the most available sizes into which each description of timber should be sawed, as well as the character of stock which it is advisable to ship.

ST. LOUIS INSPECTION.

In White Pine and Hardwood inspection the customs of St. Louis are almost identical with those of Chicago, so that it is unnecessary to repeat them. Reference may therefore, upon these points, be made to the chapters on Chicago Gradings or Inspection. Missouri and more southern states, however, ship large quantities of Yellow or Pitch Pine, long leaf, to the St. Louis market, and the customs prevailing at that point are substantially the same, as regards inspection, as those applying to the same timber at other points.

YELLOW PINE.

Yellow Pine Boards are divided into Clear or First Rate, Second Rate, Third Rate and Culls.

Clear. Must be clear, free from all defects; in lengths of twelve, fourteen and sixteen feet, and the thickness one and one-sixteenth-inch. Longer even lengths and greater thickness is allowed, but is usually ordered for special purposes when needed.

Second Rate. Has one clear face, or may have two defective faces; first, when the defects are limited to a

bright sap, not over one inch in width on one or both edges, but without wane; or, second, when the piece has one blue edge or one waney edge, neither being over one inch in width; in both cases the faces being in all other respects clear, with the exception of one or two sound knots, not over one-half inch in diameter, which may show through the piece.

Third Rate. A grade having more defects than described in Second Rate, but free from shakes, large unsound knots or rot. Lumber of less than standard thickness is included in this grade.

Culls. Large unsound knots, shakes or rot.

FOUR INCH STRIPS.

Are graded as Clear or First Rate, Second Rate, Third Rate and Culls. Length to be twelve, fourteen or sixteen feet; thickness, one and one-sixteenth inch, width four inches full.

Clear or First Rate. Must be clear, as in wider lumber, and perfect in length, width and thickness.

Second Rate. Either one perfect face or both faces being in all respects clear, except that it may have two sound knots of not over one-half inch in diameter, which may show through to both sides.

Third Rate. Will allow of more defects than Second Rate, but free from shake, large unsound knots or rot. Boards below the standard in thickness are included in this grade.

Culls. Include all large unsound knots, shakes or rot.

SIX INCH STRIPS.

Are graded as Clear, or First Rate, Second Rate, and Culls. Lengths, twelve, fourteen and sixteen feet; thickness one and one-sixteenth inch; width, six inches full.

Clear or First Rate. Are perfect pieces of full length, width and thickness.

Second Rate. Pine having one clear face, or two defective faces, where the defects are limited upon one face to bright sap not over one quarter of the width of the board on one edge, or narrow bright sap on both edges, but no wane; or to one blue edge or to one narrow wane. Both faces must in this case be clear, except that three sound knots of less than one inch diameter will be allowed, which may show through the board, provided they lay in a straight line parallel with the edge.

Third Rate. May have more defects than are de-

scribed in Second Rate, but must be free from shakes, large unsound knots or rot. This grade also includes lumber below the standard thickness.

Culls. Boards having large unsound knots, shakes or rot.

STAIR PLANK.

Are ten inches and over in width; twelve, fourteen and sixteen feet in length; sawed to one and one-sixteenth, one and five-sixteenths and one and nine-sixteenths inches in thickness.

The grading and inspection of Stair Plank are the same as in Boards.

WILLIAMSPORT INSPECTION.

The well known Allegheny region is largely represented by the operators at Lock Haven and Williamsport, Pa., and the inspection customs of the former are governed by the rules of the West Branch Lumberman's Exchange, as is the case in the surrounding country, outside of those two points, where lumber is handled to any extent. As the shipments from this section are largely to Philadelphia and Baltimore a knowledge of the inspection customs of the producing point, conveys as well an idea of the inspection at the consuming or distributing points. As in all other markets allowance must be made for variation in practice, while the rules are observed as a standard.

RULES OF INSPECTION

Adopted by the West Branch Lumberman's Exchange, and in vogue at Williamsport and other contiguous points.

Selects and Better. Shall include all the better grades which are equal in value to the following described piece; not less than eight inches in width and perfect up to ten inches in width, except sap, which may be admitted one and one-half times the thickness on the back side.

Above ten inches wide will admit of imperfections equal to three small knots, and sap one and one-half times the thickness on face side; above fourteen inches wide will admit of imperfections equal to sap as above, and larger knots and straight split one-sixth the length of the piece; as the width increases, will admit of greater imperfections, but not enough to decrease the value below the first described piece.

Picks. This grade shall include all boards below the grade of Selects and better, that shall be equal in value to a piece of from six to nine inches wide, that shall have a perfect face, with back side sound and free from badly stained sap.

Above nine inches wide, will admit of defect equal to sap two inches on either edge of face side, and knots equal to one knot two and one-half inches in diameter.

Above thirteen inches wide may admit of defects equal to sap nine inches in width on either edge of face side, and three knots two and one-half inches in diameter. All boards of this grade above ten inches, may admit of straight split, one-sixth the length of the piece, but no board shall be of less value than the first described piece.

Flooring. Shall include all boards below Picks that shall be five inches in width, with red sound knots

not exceeding one and one-half inches in diameter. Will admit of sap one and one-half times the thickness of the piece, and when above ten inches in width may admit of straight split one-sixth the length of the piece, and should be free from shakes, rot and loose knots.

Third Common or Barn Boards. Shall include all lumber below the grade of flooring that is of fairly sound character. May admit of straight split one-quarter the length of the piece, and should be free from large loose knots, bad shakes and rot.

Culls and Samples. Shall consist of all lumber of a generally unsound character, and where the imperfections are too great to allow of the board being used for the ordinary uses of Third Common or Barn Boards. Worthless, rotten lumber should not be counted in this grade.

Pickets—No. 1. Shall be clear of knots, wane and black sap; not less than seven-eighth inches thick and two and a half inches wide.

No. 2. May include sound knots, stained sap and wane not to exceed one-half the thickness of picket.

Square Pickets to be of same grades.

Lath—No. 1. Shall be one and a half inches wide, not less than three-eighths of an inch thick, packed in bundles of 100 pieces to each bundle.

Hemlock. Shall consist of two grades; merchantable and cull hemlock.

Shingles. Are graded Nos. 1 and 2, and are twenty-four inches in length.

No. 1. Should be clear of sap and knots; five-eighths-inch at the butt and one-eighth-inch at the point.

No. 2. Should be clear at least one-third the length from the butt, but the balance will admit of small knots, if sound, and some sap.

MAINE SURVEY.

Maine was at one time the heaviest producing section in White Pine. Fifty years ago the lumbermen of New York, Connecticut and contiguous states, made annual ocean voyages to Bangor and other points in Maine for their supplies of Pine and Spruce lumber and timber, and the hardy lumbermen of that day, or their sons and successors, have been among the most forward and enterprising agents in the settlement of the then unknown forests of the Northwest. Year by year have the forests of Maine yielded to the brawn and muscle of the lumbermen, and the insatiate appetite of the saw-mill, until to-day the character of the Pine resources of the state is well depicted in the designations which attest the prevailing systems of Inspection. While the quantity of pine is very much reduced, the quality of it has also deteriorated in proportion, and the "Survey" is less to the advantage of the purchaser. Maine still boasts a large supply of Spruce and Hemlock, and will be able to supply these for many years to come. In fact, from the well known rapid growth of Spruce, the state will, for a generation

at least, be still able to supply its quota. The Survey of Spruce is rather in favor of the purchaser.

PINE.

No. 1. Is entirely dispensed with, and the first quality now recognized is called No. 2.

No. 2. This may be of any length or width, provided, however, that the short lengths and narrows must be good; the shorter and narrower the board, the better the quality required. A board twelve feet long and five or six inches in width, must be entirely free from knots and sap, and must be straight in grain. Larger boards must be *nearly* free from knots, sap and shake.

No. 3. Must be free from shakes, but a few knots or a little sap will not condemn it. The size of the board goes far to determine this quality; very small pieces, otherwise up to grade, would be classed as No. 4.

No. 4. Is a small board usually free from knots, but with some sap. If large boards are put in this number, it is because one quarter or one-third of the piece is shaky, although the balance may be good.

The market recognizes, also, two kinds of shipping boards (designated "Shippers") viz: Smooth and Common.

Smooth Shippers. Are boards without shake or case knots, or any large knots.

Common Shippers. Are boards coarse and knotty, eight inches and upward in width, and twelve feet and upward in length. (These are sometimes manufactured under special orders, when they may be nine inch, ten inch, or even greater widths.) In this grade splits, red streaks or very shaky boards are objectionable.

Narrows, or Narrow Boards. Is the next grade to Common Shippers, and consists of boards too small for Shippers. These must not be very coarse; must be suitable for floor boards.

Poor Fours. These consist of sappy, shaky, or knotty boards, not suited to be classed in either of the foregoing descriptions.

Scoots. Are the lowest grade; rotten boards and all others not admissable in other grades are surveyed as scoots.

The market also handles what is termed *Sapling Pine* or *Gang Boards.* These are usually manufactured in gang mills, the survey as to quality being about the same as the balance of the grades described, except as to designation, the 2s, 3s and 4s being put together under the one term *planers.* The shippers,

narrow boards, poor 4s and scoots are surveyed as described under those heads.

Gutter and Deck Plank. The rule last described is also applied to gutter and deck plank.

SPRUCE.

Spruce is known in the two qualities of Merchantable and Scoots. The scoots comprise boards which are cross grained, renty or rotten. In surveying the grades are divided into two qualities, viz: *Floor Boards* and *Coarse.* The floor boards must be nearly free from knots, all others are coarse.

BURLINGTON, VERMONT.

Although doing a large business in lumber the extensive market of Burlington has no systematized method of inspection. Steps are, however, in progress looking to that end, and probably before long rules and regulations regarding inspection will be adopted by the dealers in that section. While each lumberman now has an inspector of his own, a variety of customs prevail, notwithstanding an endeavor on the part of all toward uniformity.

The grades recognized in the Burlington market are as follows: Selects, Shelving, Second Shelving, Pickings, Shippers, Box, and Mill Culls.

These gradings apply to wide lumber from eight inches and upward.

Strips twelve feet long and upward are classed as 1st Quality, 2d Quality, 3d Quality and Box.

Under twelve feet in length the classes of seconds and thirds are combined as one, while all unfit for this grade go into a still lower grade of 3d Quality or into a new grade of Box.

Spruce is divided into three grades, namely: Clear, No. 1 and No. 2. (See Maine Survey.)

Selects. Comprise the finer grades of lumber, and include all fair widths approaching to the upper grades of other markets, and suited to all the finer finishing purposes, for which the timber is adapted.

Shelving. Includes ten, twelve and fourteen-inch stock, and is classed as first and second shelving, as to relative quality and adaptability to the purpose indicated; first quality ranks about seven dollars per thousand below selects, while the second quality is from five to seven dollars below the first. In both qualities more or less knots and sap will be allowed, not affecting the board for the purpose from which it derives its name.

Pickings. A grade of lumber of any width, suited to one side finishing, embracing sap boards, and generally such lumber as while from width not fitted for shelving, is more defective than selects, yet filling a position which must otherwise be occupied by selects. As in other markets, it may be called the cream of the common. It is relatively in price about twelve dollars below selects.

Shippers. Are of diversified widths, without shake or case knots, and free from large coarse knots, comprising the best of the common after the picks are removed.

Box. Comprise a grade poorer than shippers, yet

taking the run of the common, in all fairly sound and merchantable lumber. In price it is from two to three dollars below shippers.

The grades of shelving (first and second) Pickings, Shippers and Box are, one and all, selections from Common, made with reference to adaptability to the uses indicated by their designations.

Mill Culls. Are the poorest grade of lumber adapted to any utility, or recognised as merchantable, and bear the same description as the same grade in other markets.

NEW ORLEANS INSPECTION.

TIMBER.

Round. Length of all logs measured to square butt of log, if with pins at ends, length measured inside of one of the pins, allowing the other. Proportional deductions made from length for extra pins or faults.

Octagon Logs, or logs having more than four faces. shall be measured at small end, string measure, girting the log, and one-quarter of the girt shall be considered as the fourth of the square. Waney logs, however, not to be comprised amongst the above, but to be measured as explained hereafter.

If crooked, the lines shall be drawn to make the same the chord of the arc of each crook or bend, thus shaping it a perfect squared log from extreme points.

Cypress Timber in round logs, when pecky, ten feet off length of logs shall be allowed and deducted as compensation for said fault.

Poplar and Cottonwood in round logs to be received at inspection must measure twenty-four inches diameter, inside bark, by twelve feet long.

Black Walnut. In round logs, none shall be received as merchantable measuring less than twenty-six inches

diameter, inside bark, and ten feet long, unless by special agreement.

Squared or Waney. All logs to be measured gross and net. Gross measurement taken at largest end or stump, for the square, and at the extreme length of log or spur if any in same. Net measurement taken midways of log, deducting for net on square logs one inch off two sides of logs, and if waney an additional reduction proportional to wane. In domestic timber with pins or pin holes, the length for net measurement must be taken inside pins or pin holes.

Logs of lengths under regulations to be called log ends, and shall be paid on their net measurement one-half price paid for logs of standard dimension.

Sawed or hewed timber shall be put in three classes, viz: Choice, Prime and Merchantable.

Choice. To be sound, square edged and square butted; must not show more than two inches of sap on either face, free from circular shakes or unsound knots.

Prime. To be sound and square butted, to show heart on each face, may show place of wane not to exceed two feet at any one place, and that not more than three places in any one corner.

Merchantable. To be sound and square butted, not

more than three inches in width of wane on a corner, need not show heart on any side.

SPARS.

Mast Sticks. Must be worked eight square, and must be straight, well hewn, and show heart every four feet in length on every face; free from coarse or unsound knots and other defects; knots over two inches in diameter are called coarse; ring knots and knots less than three feet apart condemned. Not more than four knots must be left in one spar, and must be worked with as little taper as possible.

LENGTH.	DIAMETER AT CENTER.	DIAMETER AT TOP.
66 feet.	Not less than 21 inches.	Not less than 17 inches.
69 feet.	" " " 23 "	" " " 18 "
76 feet.	" " " 26 "	" " " 19 "
79 feet.	" " " 27 "	" " " 20 "
82 feet.	" " " 28 "	" " " 21 "

Ordinary spars may be hewn four square, though eight square is preferred, may show wane on four corners full length, not over three inches wide in widest place; must show heart full length on four sides, taper as little as possible; must be straight and free from coarse or unsound knots or other defects. Ring knots and knots less than three feet apart condemned. Not more than four knots must be left in one spar.

LENGTH.	DIAMETER AT CENTER.
66@68 feet	17 inches and upward.
69@72 feet	18 inches and upward.
73@76 feet	19 inches and upward.
77@80 feet	20 inches and upward.
81@84 feet	21 inches and upward.

Octagon spars measured with calliper, and square spars with dip rod (three inch hook). Size and length required to hold full. Fractional parts of an inch or foot not counted.

N. B. All the above correspond also to cypress, with only two exceptions. 1st. That cypress having small hollow knots inside the logs, when manufactured in lumber, such knots are not allowed in classes Choice and Prime, but only in class Merchantable. 2d. That cypress, whether it be timber or lumber, can be received in lengths of twelve feet and upward unless differently stipulated by contract or agreement.

WHITE OAK AND ASH.

White oak and ash shall be No. 1 or Choice, No. 2 or Prime, No. 3 or Merchantable.

Choice or No. 1. Logs to be from body of tree thirty-five or fifty feet long and upward, eighteen to thirty inches square and upward. To be square butted with saw, straight grained, free from heart or side rot, worm holes, large or unsound knots, splits, checks, shakes, frost or sun cracks; good, sound sap on two corners allowed, not to exceed one inch in each corner for every twelve inches in width. If hewn, free from spalls and ax scores, and not to taper over one and one-half inch for every twenty feet in length, and squared

to sharp edge. Pins allowed, if these should be the only defect, provided same be found only at both ends, and one side of logs, and not further than six inches from each end, but none in the middle, nor on two sides of logs.

Prime or No. 2. Length to be from twenty-five to fifty feet and upwards, and to be sixteen to twenty-five inches square and upward, straight grained. To be square butted with saw, splits or checks to be parallel to two sides of log on one end, and allowed at the other end if parallel to the same side of the opposite end. Sap if sound and good allowed on three corners, not to exceed one inch in each corner for every twelve inches in width. Timber to be free from worm holes, large and unsound knots, wind or other shakes, sun cracks allowed only on one side or face of logs; pins or pin holes allowed if not more than nine inches from each end and only on one side of logs. Diameter of heart rottenness, if any, not to exceed one-twelfth of diameter of log, and not to exceed one foot for every twenty feet in length, but no side rottenness allowed. If sawed or hewed, to taper as per Class No. 1, wane not to exceed one and one-half inch to perfect square of logs. If hewed to be free from ax scores.

Merchantable, or No. 3. Logs to be twenty to thir-

ty feet and upward in length, and to be nothing under fourteen to twenty inches and upward square; to be square butted with saw, splits or checks allowed as in Class No. 2. Sap allowed on four corners not to exceed one inch in each corner for every twelve inches in width. Timber to be free from large or unsound knots and worm holes. Wind or other shakes at one end of log received; sun or frost cracks allowed on two sides of logs, pins and pin holes at end and in middle, if not too numerous and only on one side of logs. Heart rottenness received as per Class No. 2, and a slight side rottenness received if only on one side. If log hewn, ax scores admitted if not too numerous. Wane not to exceed two inches to perfect square of logs. Logs to taper two inches for each twenty feet in length. Any timber not within above classification is called rejected and cannot be branded as inspected, though by special contract it may be accepted by purchasers.

Classification of Pine, Cypress, Poplar, Cotton and other soft woods. All kinds of lumber are measured full contents, the question of sap, etc., etc., being always determined by contract and stipulated classification of same.

Flitch. All kinds of flitch to be measured at small

end of pieces, inside sap on one edge and sap measured on the other edge.

DEALS. Deals shall be put in three classes, viz.: Choice, Prime and Merchantable.

Choice. Sound, square edged and square butted with saw, all heart with exception of small streaks of sap on one face, comparatively free from knots, and entirely free from shakes and splits, nine inches and upward in width, three inches and upward in thickness, and twelve feet and upward in length.

Prime. Sound, square edged and square butted, one heart face, three-fourths heart on the other face, entirely free from shakes, splits, large or unsound knots, nine inches wide and upward, and twelve feet long and upward.

Merchantable. Sound, square edged and square butted, one heart face and show heart on other face, free from through shakes, splits and unsound knots, nine inches wide and upward, three inches thick and upward, and twelve feet long and upward.

SCANTLING. Scantling shall be put in two classes, viz: Prime and Merchantable.

Prime. Must be square edged, three corners heart, sound, evenly sawed, free from large or unsound knots, through shakes or splits, twelve feet long and upward,

sizes 2x3 to 11x11 inclusive. Sizes from 8x8 to 11x11 inclusive may show sap on all corners, but not to exceed one to one and one-fourth inch on any one corner in proportion to the width of the scantling.

Merchantable. Sound, square edged, evenly sawed, free from through shakes and splits, sizes same as Prime. Four corners sap allowed as in class Prime.

PLANK. Plank shall be put in two classes, viz: Prime and Merchantable.

Prime. Must be sound, one heart face, two-thirds heart on the other face, square edged, evenly sawed, free from through shakes or splits, large or unsound knots, one and one-fourth to three inches thick by ten inches and upward and twelve feet long and upward.

Merchantable. Sound, one heart face, evenly sawed, square edged, free from through shakes, splits or unsound knots, one and one-quarter to three inches thick, ten inches wide and upward, twelve feet long and upward.

FLOORING. Flooring shall be put in three classes, viz: Clear, Prime and Merchantable.

Clear. Must be sound, free from sap, knots, shakes and splits.

Prime. Must have one face free from sap, and the opposite merchantable.

Merchantable. Must show one-half heart on most sappy face the whole length, free from through and round shakes or unsound knots.

All flooring must be sawed plump for any size it is calculated for.

Edge boards must be one or one and one-fourth inch thick, any width or length, must be sound, square edged, free from loose knots or splits, and show heart on both sides.

All lumber of a merchantable quality and upward must be square butted. All refuse cullings, or lumber of a quality below these classifications to have no class but be sold on its merits. Cypress lumber has two special classifications besides those similar to pine, as follows:

Narrow.—To be from four to nine inches in width, three-quarters to one inch thick, and must be sound, square edged and free from sap.

Box Stuff.—To be of any width from two inches and upward, and of one inch full thickness, square edged and free from sap.

LUMBER. Is to be classed also No. 1 or Choice, No. 2 or Prime and No. 3. or Merchantable.

Choice or No. 1. Shall be sound, square edged and butted with saw, and evenly sawed. Widths to be from

twenty to thirty inches and upward. Thickness from one-half to eight inches. Length from twenty-five to fifty feet and upward. Entirely free from splits, checks, large and unsound knots, pins or pin holes, frost or sun cracks, worm holes, wind or other shakes, and with only one-eighth of an inch of sound sap on one corner, for every twenty inches in width.

Prime or No. 2. Shall be square edged, butted with saw and evenly sawn. Widths from sixteen to twenty inches and upward. Length from twenty to fifty feet and upward; entirely free from shakes, frost and sun cracks, splits, large or unsound knots, and worm holes. Only two pins or pin holes accepted at each end at six to nine inches from end, and one inch sound sap on two corners allowed for every sixteen inches in width.

Merchantable, or No. 3. Shall be square edged, square butted with saw, and evenly sawn. One heart face on one side and must show heart on two-thirds of length of other face; sap, however, must be sound. Free from through shakes or through splits, and entirely free from large or unsound knots. Pins or pin holes as per Class No. 2. Sun and frost cracks allowed on sappy face only, and not to go beyond two inches in depth on any one face. Lengths from sixteen to twenty feet or more.

FLITCH. Same classifications but dimensions to be taken as stated under the head of Classification.

BLACK WALNUT, CHERRY AND OTHER DOMESTIC HARDWOODS.

TIMBER. Shall be put in four classes, viz: No. 1, or Choice, No. 2 or Prime, No. 3 or Merchantable, and Refuse.

Choice or No. 1. Logs to be from body of tree, straight grained, and from twelve feet and upward in length, and from twenty-eight inches and upward square; to taper only three-quarters to one inch for every twelve feet in length. To be square butted with saw, free from all defects to make it suitable to best kind of work. Wane allowed one and one-half inch to full square of log for every ten inches width or depth. Pins allowed, if this be the only defect, provided the same be found only at both ends, and on one side of logs, and not farther than six inches from each end.

Prime, or No. 2. Logs from body of tree and in length same as No. 1, and with same taper, and from twenty-two inches and upward square. To be straight grained, square butted with saw, free from shakes, bad or large knots, heart or side rottenness, one and one-half inch for every ten inches in width or depth allowed for wane and corresponding sap to same, also

pins at both ends of logs, but not further than six inches from each end, and shall be free from splits not parallel to one face.

Merchantable, or No. 3. Logs in length of ten feet and upward, and eighteen inches square and upward. Taper and wane allowed as in class No. 2; free from bad shakes, large or unsound knots, and bad splits; pins allowed as in class No. 2, also splits at the ends of logs though not parallel to sides.

Refuse. All timber losing one-third or more of its measurement as allowance for defects shall be called Refuse, and will be considered unfit for shipment unless differently stipulated in contracts of sale.

LUMBER. Shall be divided in three classes, viz: No. 1, No. 2 and Refuse.

No. 1. Includes all boards, planks and joist free from rot, shakes, and nearly free from knots, sap and bad taper. All pieces to be evenly sawed, square butted, and square edged. Knots to be small and sound, and so few as not to cause waste to the best kind of work. A small split on one end of a board or plank, if not too long and parallel with edge of piece, is also classed No. 1.

No. 2. All pieces must be square edged and evenly sawed; this class includes all other descriptions if so

manufactured, except when one-third is worthless, that is, boards, joist or planks containing sap, knots, splits on one end, and all these imperfections combined make less than one-third of a piece unfit for good work, and only fit for ordinary purposes, such piece is classed No. 2.

Refuse. Includes all boards, planks or joists badly manufactured by being sawed in a diamond shape, smaller in one part than in another, splits on both ends, or with long split or splits not parallel to edge, with large and bad knots, worm or pin holes, sap, rot, shakes, or any other imperfections which would cause any one piece of lumber to be one-third worthless or waste.

MAHOGANY, SPANISH CEDAR, AND OTHER LIKE FOREIGN HARDWOODS.

TIMBER. Shall be put in four classes, viz.: Choice, Prime, Merchantable and Refuse.

Choice Cedar. Must be straight grained, free from knots and all and every other defect. Shall be manufactured straight and evenly, may be hewed or sawed and ought to be square butted with saw before shipment, as all slant heads shall be deducted from gross to sale measurement, full up to perfect square of logs, which must measure from twelve feet and upward long, and eighteen inches and upward square. Wane of

three-fourths of one inch to perfect square is permitted, but is invariably deducted in its proportional ratio to the log from gross to sale measurement.

Choice Mahogany. Will correspond to above specifications, except that logs may be curly or crossgrained, and sizes must be twelve feet long and upward, and twenty inches and upward square.

Prime Cedar. Must be straight grained and free from large knots, small ones, if sound, being allowed. Shall be manufactured as in class Choice. Wormy sap not objectionable if worm holes do not go through to the body of the wood, and a wane of two inches to perfect square of logs is permitted, also, rotten or decayed heart not to exceed one-eighth of length of log; splits not to be over six inches for every ten feet of length of log, and sun checks not to be over two inches deep in any one face are also permitted, and though all these defects are permitted, they are invariably deducted from the gross to the net, or sale measurement. Logs must be ten feet and upward long, and sixteen inches and upward square.

Prime Mahogany. Shall correspond to all the above specifications except that logs may be cross-grained, curly and have large knots, if sound, and that sizes

must be ten feet long and upward, and eighteen inches and upward square.

Merchantable Cedar. Logs may be manufactured somewhat uneven, but ought to be square butted with saw, as explained in class Choice. Can be crooked, waney, sappy, wormy, split, sun checked, and have rotten heads and knots, large or small, provided the logs shall not lose more than one-third from the gross to the net sale measurement for these defects. Logs can be from nine feet long and upward, and fourteen inches square and upward. Wood may be curly or cross-grained.

Merchantable Mahogany. Shall correspond to all the above specifications.

Refuse Cedar and Mahogany. All other descriptions of wood admitted in this class which by its defects will lose more than one-third from the gross to the net sale measurement, provided logs shall measure nine feet long and upward, and twelve inches square and upward.

LUMBER. Shall be put in three classes, viz.: Choice, Prime and Merchantable.

Choice. Includes all boards, planks and joists, to be square edged, evenly sawed and free from sap, rot, shakes or splits, knots, if any, to be small and sound,

and free from any fault which may cause waste for the best kind of work.

Boards and planks to be not less than eighteen inches wide and upward.

Prime. To be manufactured as class Choice, splits parallel to edge of piece allowed if not exceeding six inches long for every ten feet in length of piece. A streak of sap on two corners allowed, and pieces not to be less than fifteen inches and upward wide.

Merchantable. Includes all other descriptions of boards, planks and joists, provided all imperfections combined shall not make one-third of the measurement of any piece, any such being rejected and not entitled to classification.

CIGAR CEDAR STUFF.

Cigar Cedar Stuff shall be put in two classes, viz.: No. 1 and No. 2.

No. 1. All boards to be perfect, free of knots, splits, sap, worm holes, and any defect which would render any piece unfit for the best work.

No. 2. Includes all other descriptions, except when one-third worthlesss, in which case any such piece is rejected, purchasers having the right to refuse them altogether.

All lumber, such as planks, boards, scantlings, joists,

and deals, shall have their full contents marked on each piece, and the certificate given by the inspector will state all items of specifications corresponding to the survey made, and also the number of pieces of each class.

For round timber the certificate of the inspector will only give the net contents of each log, and for square timber the logs shall be numbered, and the certificate of measurement must correspond to each number, giving both the gross and net measure of each, and the faults found when surveying them.

In all circumstances domestic timber of all descriptions, when rafted, will class Choice, if with no other fault in same but wooden pins needed for its safety in rafting it, provided, however, that same be placed only at both ends of logs not further than nine inches from each end, and none in the middle.

STAVES.

No. 1, pipe....	60	in. long,	5@6	in. wide,	1 1/2	in. thick on thin edge.
No. 2, pipe....	56	"	5@6	"	1 1/2	" "
No. 3, pipe....	56	"	4@5	"	1	" "
No. 1, hogsh'd.	48	"	5@6	"	1 1/2	" "
No. 2, hogsh'd.	44	"	5@6	"	1 1/2	" "
Claret staves .	40	"	5@6	"	1 1/2	" "
Barrel staves .	33	"	5@6	"	1 1/2	" "

All of the above staves must be made of white oak, over cup or cow oak, and riven with the grain to as equal thickness as possible. If in riving, a stave is

thicker on the back, the surplus timber should be taken off, thus making both edges about even in thickness. An allowance of two inches should be made for crooked sawing, otherwise many staves will be under the required length. Staves must be clear of sap, heart, knots, short crooks, wind shakes and worm holes. The proper manner of sapping is to strike the stave at the end, leaving a slight bulge in the center. The timber must be cut when the sap is down, that is during the fall and winter. When a stave is spoiled by any of the defects above named, it should be sawed down to the length of a shorter dimension, as many defective 60 inch staves by sawing would make good 44, 40 or 33 inch staves. Staves are sold by the thousand of 1,200 pieces.

Hoop poles should be of smooth barked hickory, free from heavy butts and switch tops. Hogshead poles 12@14 feet in length and one full inch in diameter at the top. Barrel poles eight feet in length and full three-fourths of an inch at the top. Half barrel poles seven feet long, one-half inch at top.

BOSTON INSPECTION.

The inspection of Boston is under the state law. This law provides for a surveyor general, appointed every three years by the governor, who in turn appoints a sufficient number of deputy surveyors, removable at his pleasure, and for whom he shall be responsible. These officers are under bonds for the faithful discharge of their duties, and a record is kept and returned annually to the secretary of the commonwealth, specifying the amount and various kinds and qualities of lumber surveyed during the year.

The law provides for the following classification:

PINE BOARDS AND PLANK.

Of pine boards and planks, except southern pine, there shall be six sorts. The first shall be denominated number one, and include boards not less than one inch thick, square edged, free from rot, shakes, and nearly free from knots and sap, except such boards and planks as are not less than fifteen inches wide, and not more than one-eighth waste, which shall be received as number one. The second sort shall be denominated number two, and include boards not less

than one inch thick, and of which not less than seven-eighths is suitable for planing and first class finish: *provided*, that such boards as are clear but deficient in thickness as aforesaid, shall be received as number two. The third sort shall be denominated number three, and include boards not less than seven-eighths of an inch thick, and of which not less than three-fourths is suitable for planing and second-class finish. The fourth sort shall be denominated number four, and include boards not less than seven-eighths of an inch thick, nearly free from rot and nearly square edged, free from loose and large branch knots, and suitable for covering buildings; all Norway pine boards and planks shall be included in the fourth, fifth and sixth sorts. The fifth sort shall be denominated number five, and include all boards and planks of every description not being within the other four denominations, except when one-third is worthless, which boards and planks shall be denominated refuse.

DIMENSION.

Of pine joists and dimension timber there shall be three sorts. The first sort shall be denominated number one, and include all joists and dimension timber that are sound and nearly square edged. The second sort shall be denominated number two, and include all

other descriptions, except when one-third is worthless, which joists and dimension timber shall be denominated refuse.

SPRUCE, ETC.

Of spruce, hemlock, juniper, and southern pine, boards, planks, sawed timber, and joists, there shall be three sorts. The first sort shall be denominated number one, and include all boards, planks, sawed timber, and joists, that are sound and nearly square edged. The second sort shall be denominated number two, and include all other descriptions, except when one-third is worthless, which boards, planks, sawed timber, and joists, shall be denominated refuse.

HARDWOOD.

Of ash, maple, and other hardwood and ornamental boards, planks and joists, there shall be three sorts. The first shall be denominated number one, and include all boards, planks and joists, that are free from rot, shakes and bad knots. The second sort shall be denominated number two, and include all other descriptions, except when one-third is worthless, which boards, planks and joists shall be denominated refuse.

HEWED TIMBER.

Of hewed timber, except mahogany and cedar, there shall be three sorts. The first sort shall be denomi-

nated number one, and include all timber that is sound and nearly square edged. The second sort shall be denominated number two, and include timber of all other descriptions, except when one-third is worthless, which timber shall be denominated refuse.

SHIP KNEES.

Of oak, juniper and spruce knees, there shall be two sorts. The first sort shall be denominated number one, and include all sound knees of the following dimensions: arm or root one foot six inches long, body of knee three feet long, working thickness four inches; arm or root two feet and six inches long, body of knee three feet long, working thickness five inches; arm or root two feet and nine inches long, body of knee three feet and six inches long, working thickness six inches; arm or root three feet and three inches long, body of knee four feet and six inches long, working thickness seven inches; arm or root three feet and six inches long, body of knee four feet and three inches long, working thickness eight inches; arm or root three feet and nine inches long, body of knee four feet and six inches long, working thickness nine inches; arm or root four feet long, body of knee five feet long, working thickness ten inches and upwards. The second sort shall be denominated refuse, and shall include all

other descriptions of less dimensions than those specified in the first denomination; all knees shall have the working thickness marked thereon, and on the first sort the number "*one*" shall be marked.

The survey laws of this commonwealth were changed in 1878, making the survey of lumber optional, not obligatory. It is therefore the custom to buy and sell at western inspection, eastern inspection, mill survey, or at Boston survey, whichever way a contract is made.

The various sorts of dressed lumber are recognized, and the grading of western stock into Uppers, Selects and Fine Common is understood, being bought and sold by such inspection, without reference to Boston survey.

QUEBEC CULLING.

EXTRACTS FROM THE CULLER'S ACT, GIVING RULES FOR THE MEASUREMENT OF TIMBER, MASTS, SPARS, DEALS, STAVES, ETC., ETC.

All culling in Quebec must be done under the specification of an act of the Provincial Parliament, from which we extract the following salient points.

All square timber must be measured by one of three modes.

First. Measured off in the raft or otherwise, giving the full cubical contents without allowance or deduction.

Second. Measured in shipping order (which shall mean sound, fairly made timber); gum seams closed at the butt, and sound knots not to be considered unsoundness—lengths under the merchantable standard hereinafter mentioned, and not less than twelve feet long to be received if, in the opinion of the Culler, the same be fit for shipment.

Third. Culled and measured in a merchantable state, in accordance with the rules, standards and limitations hereinafter described. (8 Vic., cap. 49, sec. 9.)

In measuring timber the Culler employed for that purpose shall measure the length of each piece, together with the girth, and shall provide himself with a measuring rod and tape, which shall, in all cases, be English measure, tested and compared with a standard kept in the office of the Supervisor (such rod having a hook at the end five-eighths of an inch long); and also with a scribing knife, with which he shall mark, in legible characters, the length, breadth and thickness of all square timber measured or culled by him, and the mark, initials or number of the party, if required. And every Culler shall provide himself with a proper stamp with the initials of his name in legible characters, and with the following capital letters in addition:

M, which shall denote what is merchantable.

U, which shall denote what is sound and of merchantable quality, but under merchantable size.

S, which shall denote what is second quality.

T, shall denote what is third quality.

R, shall denote what is rejected or unmerchantable; which marks shall be indented or stamped on the end of each article of lumber culled, in terms of merchantable standard hereinafter described, except West India and barrel staves, boards, lath wood and handspikes.

In all cases the Supervisor and Cullers shall be gov-

erned by the following descriptions, rules, standards and limitations, in ascertaining and certifying the merchantable size and quality of lumber submitted to their culling.

SQUARE WHITE OAK TIMBER.

First Quality. Shall be free from rot, rotten knots (affecting the surrounding wood), open rings and large grub or worm holes; but small worm holes and shakes shall be allowed, according to the judgment of the Culler.

Second Quality. Shall be oak not coming within the definition of first quality, and which in the judgment of the Culler is not culls.

SQUARE HARD GRAY OR ROCK ELM.

Shall be free from rots, open rings and rotten knots, (affecting the surrounding wood); but shakes and slivers shall be allowed according to the judgment of the Culler.

WHITE OR YELLOW PINE TIMBER.

Shall be free from rot, rotten knots (affecting the surrounding wood), worm holes, open shakes and open rings; but sound knots shall be allowed, according to the judgment of the Culler.

SQUARE RED PINE TIMBER

Shall be free from rots, rotten knots, (affecting the

surrounding wood), wormholes, shakes and splits; but sound knots shall be allowed according to the judgment of the culler.

SQUARE ASH, BASSWOOD AND BUTTERNUT.

Shall be of the same quality as White or Yellow Pine square timber.

SQUARE BIRCH.

Shall be free from rot, rotten knots, splits and shakes and shall be allowed two inches of wane.

MASTS, BOWSPRITS AND RED PINE SPARS.

Shall be sound, free from bad knots, rents and shakes, and the heartwood shall be visible in spots at or near the partners.

HICKORY HANDSPIKES.

Shall be six feet long, and three and a half inches square at the smaller end.

ASH OARS.

Shall be three inches square on loin, and five inches broad on the blade. The blade shall be one-third of the length of the oar; and such oars shall be cleft straight on all sides, and free from large knots, splits and shakes.

LATH WOOD.

Shall be cut in lengths of from three to six feet, and measured by the cord of eight feet in length, by

four feet in height. To be merchantable shall be free from rot, and split freely; each billet may contain to the extent of three or four open case knots, provided they run in line, or nearly so; and it shall not have more than one twist.

PINE OR FIR BOARDS.

Shall not be less than ten feet in length, nor less than one inch in thickness, nor less than seven inches in breadth, equally broad from end to end, edged with a saw, or neatly trimmed by a straight line, and shall be free from rot, bad knots, rents and shakes, and of equal thickness on both edges from end to end; but the color alone of any board shall not be sufficient cause for its rejection, if it is in other respects sound and merchantable, and of the dimensions required by this Act.

WHITE OR YELLOW PINE DEALS.

First Quality to be merchantable. Shall be free from rot, rotten knots, grub worm holes, open case knots, shakes and splits (a slight sun crack excepted); and sound knots and hard black knots to be allowed as follows: if not exceeding three in number, and not exceeding upon the average one inch and a quarter diameter; if exceeding three and not exceeding six in number, and upon an average not exceeding three-

quarters of an inch in diameter; this proportion of knots to be allowed for a deal eleven inches in width and twelve feet in length; and deals of greater or less dimensions to be allowed for in proportion, according to the judgment of the Culler. Wane equal to half an inch on one side if running the whole length of the deal to be allowed; and if not exceeding half the length of each deal, three-quarters of an inch to be allowed; they shall be free from black or dead sap (with a slight exception, at the discretion of the Culler.

WHITE OR YELLOW PINE SECOND QUALITY DEALS.

Second Quality. Shall be free from rot, rotten knots and splits, with slight exceptions at the discretion of the Culler; and sound knots and hard black knots to be allowed as follows; if not exceeding six in number, and not exceeding upon the average one inch and a half in diameter; if exceeding six, and not exceeding twelve in number, and not exceeding upon the average one inch and one quarter in diameter (small knots under half an in inch in diameter not to be counted or considered), this proportion of knots to be allowed for a deal eleven inches wide and twelve feet in length, and deals of greater or less dimensions to be allowed for in proportion, according to the judgment of the Culler; heart, shakes and sun cracks not ex-

ceeding three-fourths of an inch to one inch in depth to be allowed, as also worm holes, at the judgment of the Culler; wane of half an inch to one inch to be allowed, according to the quality of the deal; in other respects at the judgment of the Culler. Deals rejected as not coming within the standard of merchantable, or second quality, shall be classed as culls, except that the Culler may, if requested by buyer and seller, select and classify as Third Quality the best of the deals so rejected.

RED PINE DEALS.

To be merchantable shall be free from rot, rotten knots, grub worm holes, open case knots and splits; several small sound knots to be allowed, according to the judgment of the Culler; heart shake to be allowed, if it does not run far into the deal, or form a split through at the ends; they shall be free (or nearly so) from black or dead sap; but sound sap in the corners or on a portion of one face of a deal to be allowed, according to the judgment of the Culler.

SPRUCE DEALS.

To be merchantable shall be free from rot, rotten knots, grub worm holes, open case knots, splits and shakes (a heart shake, not exceeding one-fourth of an inch, to one-half inch in depth, excepted); several

small sound knots and hard black knots to be allowed, according to the judgment of the Culler, and in the exercise of such judgment, he shall keep in view the peculiar nature of the wood, and govern his judgment accordingly: wane equal to half an inch on one edge, if running the whole length of the deal, to be allowed; and if not exceeding one-quarter the length of such deal, three-quarters of an inch to be allowed.

SPRUCE AND RED PINE DEALS.

Second Quality. Shall be deals not coming within the definition of merchantable, and which, in the opinion and judgment of the culler, are not culls, and shall be classed as second quality; and the Culler, if required by seller and buyer, may select and classify as *Third Quality* the best of the deals unfit to be seconds.

QUEBEC STANDARD HUNDRED OF DEALS.

Shall be one hundred pieces, twelve feet long, eleven inches wide, and two and one-half inches thick; and deals of all other dimensions shall be computed according to said standard. Deals of all qualities shall not be less than eight feet long, seven inches broad and two and and a half inches thick.

Deal ends shall not be less than six feet long; lengths should never fall short of full feet, or be more than

two inches over length, and shall be computed according to the Quebec standard.

MERCHANTABLE DEALS.

Must be well sawed (this point must have especial attention), and squared at the end with a saw; and the color alone shall be no objection to their being merchantable. All deals when culled shall in all cases be stamped with the initials of the culler, and the capital letter denoting their quality as such.

PROVISO AS TO SPRUCE DEALS.

Provided always that spruce deals, if not sawed at the ends prior to or at the time of culling, shall be marked with the capital letter denoting their respective qualities, with red chalk, in large bold letters.

HOW OTHER DEALS SHALL BE MARKED.

To prevent mistakes in piling all other deals shall be marked with bold strokes, in red chalk, as follows:

Merchantable shall be marked I.

Second quality shall be marked II.

Third quality (if made) shall be marked III.

Rejected, or culls, shall be marked X.

DIMENSION OF STAVES.

Standard or measurement staves shall be of the dimensions set forth in the words and figures following:

5 1/2	feet	long,	5	inches	broad,	and	from	1 to 3	inches	thick.
4 1/2	"	"	4 1/2	"	"	"		1 to 3	"	"
3 1/2	"	"	4	"	"	"		1 to 3	"	"
2 1/2	"	"	5	"	"	"		1 to 3	"	"

HEART STAVES.

Five and a half feet long, and four and a half inches broad, to be received as if of merchantable dimensions.

STANDARD MILLE.

Shall be twelve hundred pieces of five and a half feet long, five inches broad, and one and a half inches thick; and standard or measurement staves of other dimensions shall be reduced to the said standard by the tables of calculation in use.

WEST INDIA OR PUNCHEON STAVES.

Shall be three and a half feet long, four inches broad and three-fourths of an inch thick; all staves shall be straight grained timber, properly split, with straight edges, free from grub or large worm holes, knots, veins, shakes and splinters; and small worm holes, not exceeding three in number, to be allowed, according to the judgment of the Culler, provided there are no veins runnning from or connected therewith; and the Culler shall measure the length, breadth and thickness of standard staves, at the shortest, narrowest and thinnest parts; and the thickness of West India and barrel staves exceeding the standard breadth to be measured

at such breadth, to wit: four, and three and a half inches, respectively, provided the thinnest edge is not less than half an inch.

TIMBER.

The dimensions of merchantable timber shall be as set forth in the following words and figures:

OAK TIMBER.

Shall not be less than twenty feet in length, nor less than ten inches square in the middle.

ELM.

Shall not be less than twenty feet in length, or less than ten inches square in the middle.

WHITE PINE.

Shall not be less than twenty feet in length, and twelve inches square in the middle, and fifteen feet and upward in length, if sixteen inches and upward in the middle.

RED PINE.

Shall not be less than twenty-five feet in length, and ten inches square in the middle, and twenty feet and upward in length, if twelve inches square and upward in the middle.

BIRCH.

Shall not be less than six feet long, or less than twelve inches square in the middle.

TAPER OF MERCHANTABLE TIMBER.

Oak, three inches under thirty feet and in proportion for any greater length; elm, two inches; white pine, one and a half inches; red pine, two inches; ash one and a half inches; basswood, one and a half inches; butternut, one and a half inches. Bends or twists not to exceed one in number.

HOLLOWS ALLOWED.

Oak, three inches for ever twenty feet in length, and in proportion for any greater length; elm, three inches; white pine, two and a half inches; red pine, three inches; ash, two and a half inches; basswood, two and a half inches; butternut, two and a half inches.

DIMENSIONS OF WHITE PINE MASTS, BOWSPRITS AND RED PINE SPARS.

White Pine Masts, twenty-three inches and upward at partners, shall be three feet in length to each inch in diameter; twenty-two inches, three feet, and two feet extreme length; twenty-one inches, three feet, and three feet extreme length; twenty inches and under, three feet, and four feet extreme length. Hollow or bend not to exceed six inches for seventy feet, and in proportion for any greater length.

BOW SPRITS.

Shall be two feet in length for every inch in diame-

ter at the partners, adding two feet for extreme length.

RED PINE SPARS.

Shall be three feet to the inch in diameter at the partners, and nine feet extreme length; hollow not to exceed seven inches for sixty feet, and in proportion for any greater length.

REDRESSING.

In all cases where it appears that timber, masts, spars, boards, planks, deals, staves, oars or any other description of lumber, are not properly hewn, squared, butted or edged, but are merchantable in other respects, and sold as such, the Supervisor and Culler, respectively, shall order or cause the same to be properly dressed and chopped, at the expense of the seller or buyer, as the case may be, previously to their being respectively received and certified to be merchantable, such dressing and chopping to be done under the direction of the Culler in charge of the measuring or culling.

MINNEAPOLIS INSPECTION.

At a meeting of the Lumbermen's Board of Trade, held May 25, 1878, the plan for securing uniformity in the sorting of lumber was fully inaugurated, and the grades as nearly determined upon as it is possible to define them by any set of words. Entire harmony of opinion exists among the manufacturers of the city as to the uselessness of some of the grades or kinds which have been put upon the market, and it was unanimously resolved to decrease the number of kinds by striking out several. The committee appointed for the purpose, after fully considering the matter, reported the following list and description of grades:

First Clear. Shall be not less than twelve inches wide and twelve feet long; shall be free from all imperfections, with no sap, except where over fourteen inches wide; then allow not over one inch on one side.

Second Clear. Shall not be less than ten inches wide and twelve feet long; defects may be allowed, not to exceed two knots of three-fourths of an inch in diameter, or sap that will be equal to one inch on one side. If the width be sixteen inches or upwards, de-

fects may be allowed equal to three knots of one inch in diameter, or sap equal to three inches the whole length.

Third Clear. Shall be not less than seven inches wide and twelve feet long; defects, equal to three knots one inch in diameter and sap one and one-half inch wide in boards to twelve inches; and from twelve to sixteen inches wide, knots of two inches in diameter and sap two inches on one side; on boards over sixteen inches, defects may be increased to knots equal to four inches, and to four inches of sap.

Clear Strips. Shall be six inches wide and full one inch thick; will allow one inch of sap, but no other imperfections.

First Flooring. May be four, five or six inches wide; allow one inch of sap and three small sound knots, but no other imperfections. These imperfections to apply to six inch flooring and to decrease according to width.

Second Flooring. Same as first, in width; allow six small knots, and sap equal to one and one-half inch the whole length.

Common Flooring. Shall be four, five and six inches wide; allow defects equal to eight small knots; sap or shake and split not to exceed two feet in length.

First Siding, Dressed. Allow one inch sap on thin edge, but no other imperfections.

Second Siding, Dressed. Allow one inch sap on either edge, and three small knots, but no other imperfections.

Common Siding, Dressed. Allow sap and defects equal to eight small knots, and shake or split two feet in length.

First Fencing. Shall be four, five and six inches in width; shall be of good, sound character, free from imperfections that so weaken a piece that it cannot be used for substantial fencing purposes.

Second Fencing. Defective and unsound lumber.

Common Boards. Shall be seven inches wide and upward, and eight feet long; of good, sound lumber and free from large, loose knots, and well manufactured; will allow a little wane or a straight split, when otherwise sound and good.

Common Dimension and Timber. Shall be of sound lumber and well manufactured; shall have no imperfections that will render it unfit for substantial building purposes. Some wane allowed.

Common Stock. Shall be eight, ten and twelve inches wide, and of like quality with common boards.

C Stock. Shall be eight, ten and twelve inches

wide; shall be sound and square edged. Will allow from eight to twelve sound knots, according to width, and will allow Norway.

B Stock. Shall be eight, ten and twelve inches wide; shall be sound and square edged; allow from four to eight small, sound knots, or sap not to exceed four inches in width the whole length of the best side.

C Stock. May be eight to twelve inches wide, twelve to sixteen feet long, and of a quality equal to Third Clear Boards.

Sheathing Boards. Shall be boards that are unsound in quality, with loose knots, shakes, splits, and worm eaten, but of sufficient good quality to make good roofing boards, and to be six inches wide and upwards.

LOG MEASUREMENTS.

In presenting for the acceptance of log buyers a new table of log measurements, the author is aware that he has the prejudices of half a century to combat, during which time the Scribner and Doyle rules have been of almost universal acceptance. Were the tables of those authors susceptible of full authentication, the task would prove a hopeless one, for the reason that correct figures never mislead, but endure in their integrity through all time. When, however, the task was commenced of giving to the lumber trade a reliable compendium of the laws and customs governing the inspection of lumber in various localities, the compiler appreciated the importance of beginning at the inception of the business, and supplying the log dealer with the most reliable rules of measurement, through a recommendation to him to adopt one or the other of the standards already in use. Aware that in some localities Scribner's rule was the favorite, while Doyle's was denounced as incorrect, and in others, Scribner's was denounced and Doyle's commended, the author was led to make careful examination of both, with a view to a thorough analyzation of each in this work.

On taking up the latest edition of the work entitled: "Scribner's Log and Lumber Book," (1879) it was a matter of surprise to find that the publishers in announcing, under date of 1872, the ownership of the Doyle stereotype plates, as well as those of Scribner, at the same time announced the discontinuance of the publication of the Doyle and the permanent adoption of Scribner's tables. In connection with the log tables appears an announcement that from the many complaints which had been made of the incorrectness of the Scribner log tables, they had been discarded and the Doyle tables substituted.

An examination of the Doyle tables shows that so far from being made from the actual cutting up of logs; or even from a carefully prepared diagram, which should give equally correct results, a novel and arbitrary rule of reckoning had been adopted, and that on logs of all sizes, a deduction of four inches from the diameter, the remainder being then multiplied by itself, in all cases gave the number of feet in a log 16 feet in length. For example, a log 12 inches in diameter and 16 feet long: $12-4=8\times8=64$ feet. Deducting one-eighth, or eight feet, gives 56 feet as the contents of the same log at 14 feet long, and the addition of one eighth gives 72 feet as the contents of the same sized

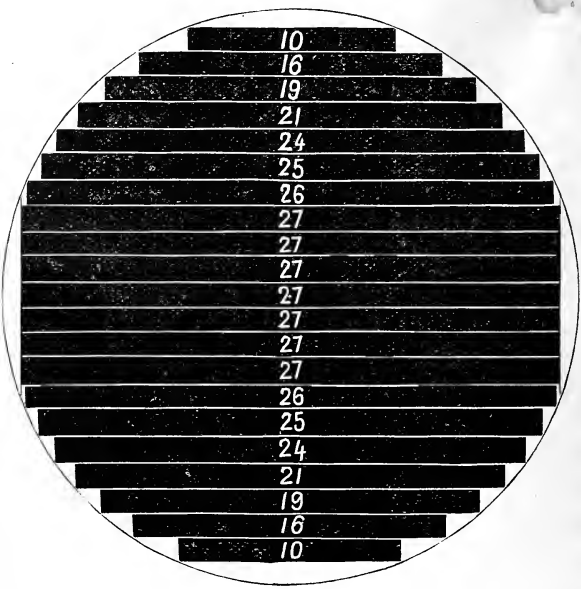
log at 18 feet in length. It will not be denied by any thinking mind that if a deduction of four inches is correct for a log of 12 inches diameter, the same amount of deduction would be utterly disproportionate in a log of 48 inches. If, however, the practical cutting up verified the correctness of the figures, then indeed might one be warranted in asserting that a universally correct method of arriving at the contents of sawlogs had been practically demonstrated. That such is not the case the following carefully prepared table must convince the most incredulous. By means of a carefully prepared diagram of each size of logs from eight up to 48 inches, and from 10 feet in length up to 30 feet, embracing all the lengths and diameters which are likely to enter into practical use, and after allowing a slab of one inch upon each side of the log, the following table has been prepared of the contents of each saw log of the sizes given, when cut into boards of one and one-sixteenth inch thickness, by a saw taking one-quarter inch saw kerf, every board being square edged, and no lumber measured under five inches in width.

Any reliable man familiar with the cutting up of saw logs is hereby challenged to disprove the assertion that a straight log of any given dimension sawed

as above stated, will yield the amount of lumber shown in the tables. Of course no allowance is made for crooked or otherwise defective logs, for this would be encroaching upon the domain of the inspector, who is supposed to make the crooked straight in taking his diameters, and to allow for all other defects, such as rotten butts, at the same time. No good sawyer will criticise the allowance of one-quarter of an inch for saw kerf; it is enough, and a sawyer who cannot file and set his circular, mulay or gate saw, to do good work at that amount of waste, is an unfit man for his position,, while in gang mills, one-eighth of an inch is about the usual waste in kerf. In allowing one-sixteenth of an inch for plump lumber, an old and well established rule that all lumber should be cut to season to its intended thickness, is adhered to. The tables are presented for the approval of those dealing in saw logs, with the assurance that in their preparation the interest of neither buyer nor seller, as such, has been considered, the only object being to produce a table which would represent the actual quantity of lumber which a log will produce under the manipulation of an ordinarily competent sawyer. To enable comparisons between this and the other rules mentioned, a synopsis of the corresponding sizes and lengths of both the

Doyle and Scribner tables will be found upon succeeding pages.

The following diagram will show at a glance the



manner in which the author has worked out each individual log. It is drawn on a scale of one-tenth of an inch to the foot and shows the number of one and one

sixteenth inch boards which can be taken from a log of 30 inches diameter, 12 feet in length, by the NORTHWESTERN LUMBERMAN standard. The fact that the actual cutting of the log into 21 boards, requiring 20 saw kerfs of one-fourth inch each, 20 lines of one-sixteenth excess, and two slabs of one inch each, equalling a deduction in the aggregate of $8\frac{1}{4}$ inches from 30 inches, the diameter of the log, give $21\frac{3}{4}$ inches, which, multiplied by itself, leaves a net result of 476 feet against 474 feet obtained in the cutting up in the manner shown—the loss of fractional parts of an inch accounting for the difference of the two feet—effectually disproves the correctness of the Doyle rule, which gives the same log a measurement of 507 feet, and establishes the correctness of the tables which follow.

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NORTHWESTERN LUMBERMAN LOG RULE.

Logs Reduced to Inch Board Measure.

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DIAMETER OF

LENGTH IN FEET.	8	9	10	11	12	13	14	15	16	17
10	21	27	39	46	49	61	75	83	92	110
12	25	34	46	53	58	73	88	108	128	141
14	29	39	53	61	67	85	102	126	149	164
16	33	45	61	70	77	97	117	144	170	188
18	37	51	69	79	87	109	132	162	192	211
20	42	54	78	92	98	122	150	166	206	220
22	46	61	85	99	107	134	163	191	220	251
24	50	68	92	106	116	146	176	216	256	282
26	54	73	99	114	125	158	190	234	277	305
28	58	78	106	122	134	170	204	252	298	328
30	62	84	114	131	144	182	219	270	319	352

DIAMETER OF

LENGTH IN FEET.	29	30	31	32	33	34	35	36	37	38
10	365	297	425	454	491	529	552	575	612	649
12	438	474	509	544	589	634	662	690	734	778
14	511	553	593	634	687	739	772	805	856	907
16	584	632	678	725	785	845	882	920	978	1037
18	657	711	763	816	888	951	993	1035	1101	1167
20	730	794	850	908	982	1058	1104	1150	1224	1298
22	803	871	934	998	1080	1163	1214	1265	1346	1427
24	876	948	1018	1088	1178	1268	1324	1380	1468	1556
26	949	1027	1102	1178	1276	1373	1434	1495	1590	1685
28	1022	1106	1186	1268	1374	1478	1544	1610	1712	1814
30	1095	1185	1271	1359	1472	1584	1654	1725	1834	1944

NORTHWESTERN LUMBERMAN LOG RULE.

Logs Reduced to Inch Board Measure.

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LOG IN INCHES.

18	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	
130	149	168	185	203	220	237	253	269	305	342	*10*
155	170	186	214	243	268	294	316	338	390	402	*12*
180	198	218	249	283	312	343	368	394	455	469	*14*
206	226	248	285	324	357	392	421	450	520	536	*16*
232	255	279	321	364	402	441	474	507	585	603	*18*
260	298	310	370	405	440	474	506	538	610	684	*20*
285	319	354	399	446	488	531	569	607	695	744	*22*
310	340	372	428	486	536	588	632	676	780	804	*24*
335	368	404	463	526	580	637	684	732	845	871	*26*
360	396	436	498	566	624	686	736	788	910	938	*28*
386	424	466	532	607	669	735	789	844	975	1005	*30*

LOG IN INCHES.

39	*40*	*41*	*42*	*43*	*44*	*45*	*46*	*47*	*48*	*49*	
687	725	759	792	835	877	922	967	1014	1060	1112	*10*
824	870	910	950	1001	1052	1106	1160	1216	1272	1334	*12*
961	1015	1061	1108	1167	1227	1290	1353	1418	1484	1556	*14*
1098	1160	1213	1266	1334	1402	1474	1546	1621	1696		*16*
1236	1305	1365	1425	1500	1578	1659	1740	1824			*18*
1374	1450	1518	1584	1667	1754	1844	1934				*20*
1511	1595	1669	1742	1836	1929	2028					*22*
1648	1740	1820	1900	2002	2104						*24*
1785	1885	1971	2058	2168							*26*
1922	2030	2122	2216								*28*
2059	2175	2274									*30*

SYNOPSIS OF SCRIBNER'S LOG RULE:

Logs reduced to Inch Board Measure by Scribner's Standard.

DIAMETER OF

LENGTH FT.	12	13	14	15	16	17	18	19
12	59	73	86	107	119	139	160	180
14	69	85	100	125	139	162	187	210
16	79	97	114	142	159	185	213	240
18	88	109	129	160	178	208	240	270
20	98	122	143	178	198	232	267	300
22	108	134	157	196	218	255	293	330
24	118	146	172	214	238	278	320	360

DIAMETER OF

LENGTH FT.	28	29	30	31	32	33	34	35	36
12	436	457	493	532	552	588	600	657	69[illegible]
14	509	533	575	622	644	686	700	766	807
16	582	609	657	710	736	784	800	876	923
18	654	685	739	799	828	882	900	985	1038
20	728	761	821	888	920	980	1000	1095	1152
22	800	838	904	976	1012	1078	1100	1204	1268
24	873	914	986	1065	1104	1176	1200	1314	1380

SYNOPSIS OF SCRIBNER'S LOG RULE:

Logs reduced to Inch Board Measure by Scribner's Standard.

LOG IN INCHES.

20	*21*	*22*	*23*	*24*	*25*	*26*	*27*	
210	228	251	283	303	344	375	411	*12*
245	266	292	330	353	401	439	479	*14*
280	304	334	377	404	459	500	548	*16*
315	342	376	424	454	516	562	616	*18*
350	380	418	470	505	573	625	684	*20*
385	418	460	518	555	631	688	753	*22*
420	456	501	566	606	688	750	821	*24*

LOG IN INCHES.

37	*38*	*39*	*40*	*41*	*42*	*43*	*44*	
772	801	840	903	954	1007	1046	1110	*12*
901	934	980	1053	1113	1175	1222	1295	*14*
1029	1068	1120	1204	1272	1343	1396	1480	*16*
1158	1201	1260	1354	1431	1511	1571	1665	*18*
1287	1335	1400	1505	1590	1679	1745	1850	*20*
								22
								24

SYNOPSIS OF DOYLE'S LOG RULE:

Logs reduced to Inch Board Measure by Doyle's Standard.

DIAMETER OF

LENGTH IN FEET.	10	11	12	13	14	15	16	17	18
12	27	37	48	61	75	91	108	126	147
14	32	43	56	71	88	106	126	144	171
16	36	49	64	81	100	121	144	169	196
18	41	55	72	91	112	136	162	190	220
20	46	61	80	101	125	151	180	211	244
22	50	67	88	111	137	166	198	232	269
24	54	74	96	122	150	181	216	254	294
26	59	80	104	132	163	196	234	274	318
28	63	86	112	142	175	212	252	296	342
30	68	92	120	152	188	226	270	316	368

DIAMETER OF

LENGTH IN FEET.	29	30	31	32	33	34	35	36	37	38
12	469	507	547	588	631	675	721	768	817	867
14	547	591	638	686	736	787	841	896	953	1011
16	625	676	729	784	842	900	961	1024	1089	1156
18	703	761	820	882	946	1012	1081	1152	1225	1300
20	782	845	912	980	1052	1125	1202	1280	1361	1446
22	860	930	1004	1078	1156	1238	1322	1408		
24	938	1014	1094	1176	1262	1350	1442	1536		
26	1016	1098	1184	1274	1368	1462	1562	1664		
28	1094	1182	1276	1372	1472	1574	1682	1792		
30	1172	1266	1366	1470	1578	1688	1802	1920		

SYNOPSIS OF DOYLE'S LOG RULE:

Logs reduced to Inch Board Measure by Doyle's Standard.

LOG IN INCHES.

19	20	21	22	23	24	25	26	27	28	
169	192	217	243	271	300	331	363	397	432	12
197	224	253	283	313	350	386	433	463	504	14
225	256	289	324	359	400	441	484	530	576	16
253	288	325	364	406	450	496	544	596	648	18
280	320	361	404	452	500	550	605	661	720	20
309	352	397	445	496	550	605	665	726	792	22
338	384	433	486	541	600	662	726	794	864	24
366	416	470	526	586	650	716	786	860	936	26
394	448	506	566	626	700	772	866	926	1008	28
422	480	542	606	672	750	826	906	992	1080	30

LOG IN INCHES.

39	40	41	42	43	44	45	46	47	48	
910	972	1027	1083	1141	1200	1261	1323	1387	1452	12
1070	1134	1198	1264	1331	1400	1471	1544	1618	1694	14
1225	1296	1369	1444	1521	1600	1681	1764	1849	1936	16
1379	1458	1541	1625	1711	1800	1891	1985	2080	2178	18
1530	1620	1712	1805							20
										22
										24
										26
										28
										30

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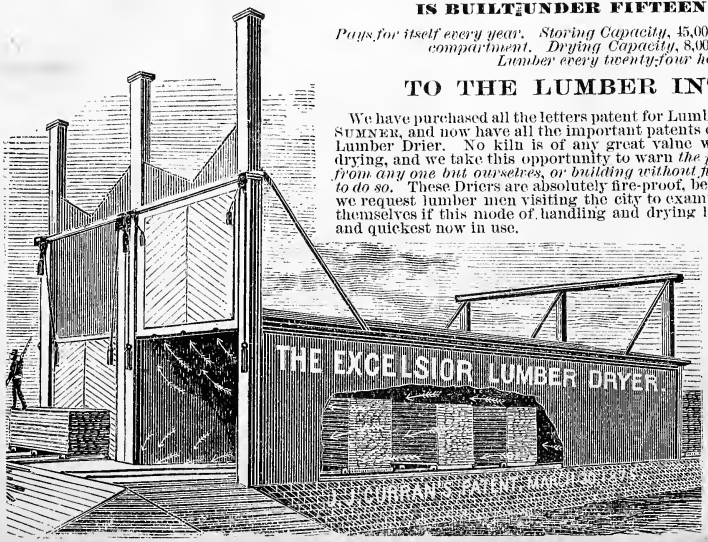

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